

TITLE 'STAR RAIDERS' VERSION 25.1 STARDATE 26-JUL-79'

GAME COMPLETE 17-JUN-79

NOTES
RAM 0-1FFF
ROM A000-BFFF
SPILL OVER ROM 9800-9FFF
E4770 ; PROG START

Final Listing

ALPHA CHARACTERS IN DMA ASCII

*CAPS = ASCII EDR \$20
NUMBERS = ASCII

40 CHAR = \$CC00
20 CHAR (*CAPS, NUMBERS), = \$CC00
20 CHAR (CAPS, LOWR CASE), = \$CE00

UNIVERSE LOOKS LIKE	SIGN	HI BYTE	LOW BYTE
-INFINITY	=	00	00
0	=	01	00
+INFINITY	=	01	FF
-1	=	00	FF

KEYCODE IS ORED WITH \$C0

STRRAM MEMORY DEFINED	STRRAM+	TYPE	NOTES
	0	OBJ0	ZYLON
	1	OBJ1	ZYLON
	2	OBJ2	PHOTON
	3	OBJ3	PHOTON
	4	MISSLE	PHOTON
	5-N	PLAY.	STARS
	N+1-M	PLAY.	EXPLOS STARS

*=\$0062

***** POWER UP CLEARED RAM *****

0062	MISDIF	; MISSION DIFFICULTY
	*\$+1	
0063	RESET	; ONE SHOT CONSOL KEY
	*\$+1	
0064	ATRACT	; GAME OVER FLAG =FF, ATRACT MODE
	*\$+1	
0065	REPMSG	; REPEAT MESSAGE BYTE
	*\$+1	
0066	TIMOUT	; ATRACT MODE TIMEDOUT REG
	*\$+1	

0067
0067

PAGE0
PGGCT

WACT FOR VBLANK= 00

***+1

0068

PNTR

***** TEMP REG RAM *****

; 2 BYTE MISC. TEMPORARY REG POINTER

006A

TEMP

***+2

; TEMPORARY REGISTER

006B

TEMP1

***+1

; TEMP REG

006C

TEMP2

***+1

006D

TEMP3

***+1

006E

TEMP4

***+1

006F

NTEMP

***+1

; NMI TEMP REG

0070

SPEED

***+1

***** SHIP SPEED RAM *****

; SPEED O CURISER

0071

WARP

***+1

; SPEED DESIRED AS OPPOSED TO SPEED , THE PRESENT SPEED

0072

TIMERX

***+1

***** TIMERS RAM *****

; USED FO STAR INTENSITY

0073

ETIMER

***+1

; EXPLOSION TIMEOUT

0074

SECOND

***+1

; SECOND TIMEOUT

0075

BSEQTM

***+1

; STARBASE SEQUENCER

0076

BINTIM

***+1

; BINARY TIMER

0077

BINNMI

***+1

; BINARY TIMER IN NMI

0078

JMPTIM

***+1

; TIME TO JUMP RAM LOC

0079

NSTAR

***+1

***** STAR POINTER RAM *****

; LAST BYTE OF STAR RAM TO STORE, EITHER RMLAST OR STLAST

007A

CNSTAR

***+1

; LAST BYTE OF STAR RAM TO CLEAR

007B

BASFLG

***+1

***** CONTROL FLAGS AND ENERGY RAM *****

; STARBASE FLAG

007C

TRKFLG

***+1

; AUTO TRACKING = FF

007D

SHENER

***+1

; SHIELD ENERGY 0 OR 8

007E

ATENER

***+1

; ATTACK COMPUTER ENERGY

007F

ENFLAG

***+1

; LS BYTE OF ENERGY , TELLS WHEN TO DEC ENERGY

0080

WPENER

***+1

; WARP ENRGY DEPENDS ON WARP

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      ***+1
      *****
      ***** MISC RAM *****
      ; SPACE BACKGROUND COLOR
00B1      SPABAK      ***+1
00B2      PHITS      ; PHOTON HIT DETECT REGS
      ***+2
00B4      PHOFLG      ; ONE SHOT PHOTON
      ***+1
00B5      PHOTIM      ; REPEAT TIMEOUT
      ***+1
00B6      LOKLOC      ; PHOTON LOCK VECTOR PNTR
      ***+1
00B7      PHOTOQ      ; PHOTON TOGGLE FLAG
      ***+1
00B8      LOKWAT      ; TIME BEFORE CAN LOCK AGAIN
      ***+1
00B9      LOKTAR      ; INDEX OF LOCK ON TARGET
      ***+1
00BA      HITME      ; SHIP HIT FLAG
      ***+1
00BB      REDFLG      ; RED ALERT FLAG
      ***+1
      ; *****
      ; ***** GALACTIC CHART RAM *****
00BC      GVPOS      ; CRUISER VPOS ON CHART
      ***+1
00BD      GHPOS      ; CRUISER HPOS ON CHART
      ***+1
00BE      HYVPOS      ; CURSOR VPOS ON CHART
      ***+1
00BF      HYHPOS      ; CURSOR HPOS ON CHART
      ***+1
0090      QUADRT      ; QUADRANT STAR RAIDER IS IN
      ***+1
0091      HYPENQ      ; HYPERWARP ENERGY USED
      ***+1
0092      HYPGAD      ; HYPERWARP QUADRANT
      ***+1
0093      KILBAS      ; QUAD OF STARBASE, ZYLONS ARE AFTER
      ***+1
0094      KILOCH      ; KILL LOC HPOS
      ***+1
0095      KILOCV      ; KILL LOC VPOS
      ***+1
0096      JMPPTS      ; GRADIENT VALUES
      ***+9
009F      JMQOUT      ; JUMP TIMEOUT REG
      ***+1
      ; *****
      ; ***** SCREEN MAP DRAWING RAM *****
00A0      HTARGET      ; HORIZ TARGET POSIT
      ***+1
00A1      VTARGET      ; VERT TARGET POSIT
      ***+1
00A2      TARPTR      ; TARGET SEQUENCER
      ***+1
00A3      LOKFLG      ; COMPUTER LOCKON
      ***+1
00A4      NUMPTS      ; NUMBER OF POINTS TO DRAW

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00A5      VDRAW      *==+1      ; VERT POS OF DRAW CURSOR
00A6      HDRAW      *==+1      ; HDR POS OF DRAW CURSOR
          ;          *==+1
          ;          *****
          ;          ***** THINK RAM *****
00A7      ZYTOGG      *==+1      ; WHICH ZYLON
00A8      SEGEN      *==+2      ; SEQUENCER PNTR RAM
00AA      SEGTIM      *==+2      ; SEQUENCER TIMEOUT RAM
00AC      XINDES      *==+2      ; DESIRED XINCRE
00AE      YINDES      *==+2      ; DESIRED YINCRE
00B0      ZINDES      *==+2      ; DESIRED ZINCRE
00B2      XINPRS      *==+6      ; PRESENT POINTER TO ZYWARP
00B8      BSTRAF      *==+2      ; STRAF BACK 0, OR 1
00BA      ROTTIM      *==+4      ; ROTATION TIMEOUT
00BE      PHEXWT      *==+1      ; PHOTON EXPLOSION WAIT
00BF      ATTARG      *==+1      ; WHICH ZYLON FIRED
          ;          *==+1
          ;          *****
          ;          ***** HYPERWARP RAM *****
00C0      HFLAG      *==+1      ; HYPERWARP ENGAGED FLAG, 00, FF, OR 7F
00C1      HISPED      *==+1      ; HI BYTE SPEED, 0 OR 2=HWARP
00C2      HTIMER      *==+1      ; HWARP TIMER
00C3      HPNTR      *==+1      ; POINTS TO WHICH LINE STARTS TO LOAD
00C4      HSTEER      *==+1      ; OLD HWAR CURSOR HPOS
00C5      VSTEER      *==+1      ; OLD HWARP CURSOR VPO
00C6      STERMK      *==+1      ; STEER MASK
00C7      JMPMSK      *==+1      ; INIT TARGETS IN NEW QUAD, MAX DISTANCE FROM SHIP
          ;          *==+1
          ;          *****
          ;          ***** KEYS, JOYSTICK RAM *****
00C8      HORJOY      *==+1      ; 0=NO HORIZ, 01=RIGHT, FF=LEFT
00C9      VERJOY      *==+1      ; 0=NO VERT, 01=DOWN, FF=UP
00CA      THEKEY      *==+1      ; THE KEY IN KBCODE
00CB      RATING      *==+2      ; YOUR RATING
00CD      ENDRAT      *==+1      ; FINAL RATING
00CE      ENDCLS      *==+1      ; FINAL CLASS

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      ***+1
      *****
      ***** MESSAGE RAM *****
      ***** MESSAGE TIMEOUT *****
000F      MESTIM      ***+1
00D0      DISFLG      ***+1      ; DISPLAY TYPE FLAG 0=FRONT, 1=BACK, 80=GALCHT
      ***+1      ; 40=SECTOR SCAN
00D1      SENPTR      ***+1      ; SENTENCE POINTER
      ***+1
      *****
      ***** AUDIO RAM *****
00D2      NOTSEQ      ***+1      ; NOTE POINTER
00D3      REPSEQ      ***+1      ; HOW MANY TIMES TO REPEAT
00D4      NDURAT      ***+1      ; DURAT OF NOTE
00D5      SDURAT      ***+1      ; DURAT OF SPACE
00D6      NPRIQR      ***+1      ; PRIOR OF NOE TYPE
00D7      REPTR      ***+1      ; WHERE TO REPEAT IN NOTETB
00DB      NDURTM      ***+1      ; NOTE TIMER
00D9      NOTVOL      ***+1      ; NOTE VOLUME
00DA      PHOREP      ***+1      ; REPAT NOTE FOR PHOTON
00DB      AUDEXP      ***+1      ; EXPLOS SERVICE TIMER
00DC      ATYPE2      ***+1      ; RAM FO AUDC2
00DD      ATYPE3      ***+1      ; RAM FOR AUDC3
00DE      AFREQ1      ***+1      ; RAM FO AUDF1
00DF      AFREQ2      ***+1      ; RAM FOR AUDF2
00E0      AUDADD      ***+1      ; HOW MUCH TO ADD
00E1      AUDTIM      ***+1      ; AUDIO TIMEOUT 0=ALL DONE
00E2      EXPDEL      ***+1      ; EXPLOS DELAY
00E3      BIGEXP      ***+1      ; SHIELDS DOWN EXPLOS
      ***+1
      *****
      ***** OBJECT RAM *****
00E4      GRAPH      ***+5      ; GRAPHIC FOR OBJO-4
00E9      STFLAG      ***+5      ; 0=OBJECT NOT ON (DEFINED IN THINK, OR PHOTON)
      ***+5
      *****
      ***** COLOR RAM *****
00EE      COLRAM      ***+14      ; PLAYER AND PLAYFIELD COLOR RAM
      *****
00FC      PHASE4

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ADDRESS SPACE

COLLEEN MNEMONICS

D200	POKEY	=	\$D200
D200	POT0	=	POKEY+0
D201	POT1	=	POKEY+1
D202	POT2	=	POKEY+2
D203	POT3	=	POKEY+3
D204	POT4	=	POKEY+4
D205	POT5	=	POKEY+5
D206	POT6	=	POKEY+6
D207	POT7	=	POKEY+7
D208	ALLPOT	=	POKEY+8
D209	KBCODE	=	POKEY+9
D20A	RANDOM	=	POKEY+10
D20D	SERIN	=	POKEY+13
D20E	IRGST	=	POKEY+14
D20F	SKSTAT	=	POKEY+15
D200	AUDF1	=	POKEY+0
D201	AUDC1	=	POKEY+1
D202	AUDF2	=	POKEY+2
D203	AUDC2	=	POKEY+3
D204	AUDF3	=	POKEY+4
D205	AUDC3	=	POKEY+5
D206	AUDF4	=	POKEY+6
D207	AUDC4	=	POKEY+7
D208	AUDCTL	=	POKEY+8
D209	STIMER	=	POKEY+9
D20A	SKRES	=	POKEY+10
D20B	POTG0	=	POKEY+11
D20D	SEROUT	=	POKEY+13
D20E	IRGEN	=	POKEY+14
D20F	SKCTL	=	POKEY+15
D000	CTIA	=	\$D000
D000	HPOSP0	=	CTIA+0
D001	HPOSP1	=	CTIA+1
D002	HPOSP2	=	CTIA+2
D003	HPOSP3	=	CTIA+3
D004	HPOSM0	=	CTIA+4
D005	HPOSM1	=	CTIA+5
D006	HPOSM2	=	CTIA+6
D007	HPOSM3	=	CTIA+7
D008	SIZEP0	=	CTIA+8
D009	SIZEP1	=	CTIA+9
D00A	SIZEP2	=	CTIA+10
D00B	SIZEP3	=	CTIA+11
D00C	SIZEM	=	CTIA+12
D00D	GRAFP0	=	CTIA+13
D00E	GRAFP1	=	CTIA+14
D00F	GRAFP2	=	CTIA+15
D010	GRAFP3	=	CTIA+16
D011	GRAM	=	CTIA+17
D012	COLPM0	=	CTIA+18
D013	COLPM1	=	CTIA+19
D014	COLPM2	=	CTIA+20
D015	COLPM3	=	CTIA+21

D016	COLPF0	=	CTIA+22
D017	COLPF1	=	CTIA+23
D018	COLPF2	=	CTIA+24
D019	COLPF3	=	CTIA+25
D01A	COLBK	=	CTIA+26
D01B	PRIOR	=	CTIA+27
D01C	VDELAY	=	CTIA+28
D01D	GRCTL	=	CTIA+29
D01E	HITCLR	=	CTIA+30
D01F	CONSOL	=	CTIA+31
D000	MOPF	=	CTIA+0
D001	M1PF	=	CTIA+1
D002	M2PF	=	CTIA+2
D003	M3PF	=	CTIA+3
D004	P0PF	=	CTIA+4
D005	P1PF	=	CTIA+5
D006	P2PF	=	CTIA+6
D007	P3PF	=	CTIA+7
D008	M0PL	=	CTIA+8
D009	M1PL	=	CTIA+9
D00A	M2PL	=	CTIA+10
D00B	M3PL	=	CTIA+11
D00C	P0PL	=	CTIA+12
D00D	P1PL	=	CTIA+13
D00E	P2PL	=	CTIA+14
D00F	P3PL	=	CTIA+15
D010	TRIG0	=	CTIA+16
D011	TRIG1	=	CTIA+17
D012	TRIG2	=	CTIA+18
D013	TRIG3	=	CTIA+19
/			
D400	ANTIC	=	\$D400
D400	DMACTL	=	ANTIC+0
D401	CHACTL	=	ANTIC+1
D402	DLISTL	=	ANTIC+2
D403	DLISTH	=	ANTIC+3
D404	HSCROL	=	ANTIC+4
D405	VSCROL	=	ANTIC+5
D407	PMBASE	=	ANTIC+7
D409	CHBASE	=	ANTIC+9
D40A	WSYNC	=	ANTIC+10
D40B	VCOUNT	=	ANTIC+11
D40C	PENH	=	ANTIC+12
D40D	PENV	=	ANTIC+13
D40E	NMIEN	=	ANTIC+14
D40F	NMIRES	=	ANTIC+15
D40F	NMIST	=	ANTIC+15
/			
D300	PIA	=	\$D300
D300	PORTA	=	PIA+0
D301	PORTB	=	PIA+1
D302	PACTL	=	PIA+2
D303	PBCTL	=	PIA+3

/ OPERATING SYSTEM

0216	VIMIRQ	=	\$0216	/ IMMEDIATE IRQ LOCATION
0222	VVBLKI	=	\$0222	/ IMMEDIATE VERT BLANK NMI VECTOR
0200	VDSLST	=	\$0200	/ DISPLAY LIST NMI VECTOR
E000	ALPHA	=	\$E000	

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Address	Variable	Value	Description
0282	DISPL1	=	EQUATES
028F	DISPL2	=	DISPLY+2 ; LDISP
02DF	DISPL3	=	DISPLY+15 ; LDISP
007C	DISPL3	=	DISPLY+95 ; LDISP
0032	DISTOP	=	\$7C ; LDISP SUB.
0032	VOFLOW	=	50
0032	VSTCEN	=	50
007A	VOBCEN	=	\$7A
0050	HOFLOW	=	80
0050	HSTCEN	=	80
007D	HOBCEN	=	\$7D
0051	SCPTAB	=	81 ; FOR LOADING PTAB
0064	SCBCD	=	100 ; FOR LOADING BCDCON
0028	SCVCON	=	40 ; FOR LOADING VCON TABLES
1D40	ICON1	=	\$1D40
1BFE	ICON2	=	\$1BFE
003D	HORCHT	=	\$3D ; HOR EDGE OF CHART
003F	VERCHT	=	\$3F ; VERT EDGE OF CHART
000C	STRNUM	=	12 ; NUMBER OF STARS DISPLAYED
0005	OBJNUM	=	5 ; NUMBER OF OBJECTS
0020	EXPNUM	=	32 ; NUMBER OF EXPLOSION STARS
0031	RAMNUM	=	OBJNUM+STRNUM+EXPNUM ; TOTAL NUMBER OF RAM LOC.
0004	OBLAST	=	OBJNUM-1 ; RAM LOC OF LAST OBJECT
0030	RMLAST	=	RAMNUM-1 ; RAM LOC OF LAST STAR IN EXPLOSION
0010	STLAST	=	OBJNUM+STRNUM-1 ; RAM LOC OF LAST STAR IN REAL STRS
0002	OBPHOT	=	OBJNUM-3 ; LAST PHOTON LOCATION
0003	OBCOMP	=	OBJNUM-2 ; LAST PHOTON WHIC COULD BE COMP CONT.
1B36	INSET	=	\$1B36 ; 1ST BYTE OF INSET
0064	VMAX	=	100
00A0	HMAX	=	160 ; MAX HORIZ STAR POSITION DISPLAYED
00A0	DBLUE	=	\$A0 ; DARK BLUE
0044	RED	=	\$44 ; COLOR
0092	LTBLUE	=	\$92 ; COLOR
00AF	BRTBLU	=	\$AF ; COLOR
004F	BRTRED	=	\$4F ; COLOR
0060	DRKRED	=	\$60 ; COLO
0042	DIMRED	=	\$42 ; COLOR
0090	DIMBLU	=	\$90 ; COLOR
0026	YELLOW	=	\$26 ; COLOR
0055	DIM	=	\$55 ; MEMMAP CODE FOR DIM STAR
00AA	MED	=	\$AA
00FF	BRT	=	\$FF
0040	IRGMSK	=	\$40 ; KEY INTERRUPT MASK
17E3	NOSTAR	=	\$17E3 ; NO STAR DUING ATTRACT

CHARACTER GRAPHICS

*=\$A000

A000		CGRAPH	
A000 00 7F 47	C0	. BYTE	00, \$7F, \$47, \$47, \$47, \$47, \$47, \$7F
A003 47 47 47			
A006 47 7F			
A008 00 30 10	C1	. BYTE	00, \$30, \$10, \$10, \$10, \$3B, \$3B, \$3B
A00B 10 10 3B			
A00E 3B 3B			
A010 00 7B 0B	C2	. BYTE	00, \$7B, \$0B, \$0B, \$7B, \$40, \$40, \$7B
A013 0B 7B 40			
A016 40 7B			
A018 00 7B 0B	C3	. BYTE	00, \$7B, \$0B, \$0B, \$7C, \$0C, \$0C, \$7C
A01B 0B 7C 0C			
A01E 0C 7C			
A020 00 60 60	C4	. BYTE	00, \$60, \$60, \$60, \$6C, \$7C, \$0C, \$0C
A023 60 6C 7C			
A026 0C 0C			
A02B 00 7B 40	C5	. BYTE	00, \$7B, \$40, \$40, \$7B, \$0B, \$0B, \$7B
A02B 40 7B 0B			
A02E 0B 7B			
A030 00 7B 4B	C6	. BYTE	00, \$7B, \$4B, \$40, \$40, \$7E, \$42, \$7E
A033 40 40 7E			
A036 42 7E			
A03B 00 7C 44	C7	. BYTE	00, \$7C, \$44, \$04, \$1C, \$10, \$10, \$10
A03B 04 1C 10			
A03E 10 10			
A040 00 3B 2B	C8	. BYTE	00, \$3B, \$2B, \$2B, \$7C, \$6C, \$6C, \$7C
A043 2B 7C 6C			
A046 6C 7C			
A04B 00 7C 44	C9	. BYTE	00, \$7C, \$44, \$44, \$7C, \$0C, \$0C, \$0C
A04B 44 7C 0C			
A04E 0C 0C			
A050 00 00 00	CBLK	. BYTE	0, 0, 0, 0, 0, 0, 0, 0
A053 00 00 00			
A056 00 00			
A05B 3B 3B 3B	CEG	. BYTE	\$3B, \$3B, \$3B, \$00, \$00, \$3B, \$3B, \$3B
A05B 00 00 3B			
A05E 3B 3B			
A060 80 80 80	CQCBK	. BYTE	\$B0, \$B0, \$B0, \$B0, \$B0, \$B0, \$B0, \$FF
A063 80 80 80			
A066 80 FF			
A06B 00 3C 20	CE	. BYTE	\$00, \$3C, \$20, \$20, \$7B, \$60, \$60, \$7C
A06B 20 7B 60			
A06E 60 7C			
A070 00 66 99	CINF	. BYTE	\$00, \$66, \$99, \$99, \$99, \$66, \$00, \$00
A073 99 99 66			
A076 00 00			
A07B 00 00 00	CMINUS	. BYTE	\$00, \$00, \$00, \$7E, \$00, \$00, \$00, \$00
A07B 7E 00 00			
A07E 00 00			

A0B0	00	18	18	CPLUS	BYTE	\$00, \$18, \$18, \$18, \$7E, \$18, \$18, \$18
A0B3	18	7E	18			
A0B6	18	18				
A0B8	00	18	7E	CPH1	BYTE	\$00, \$18, \$7E, \$DB, \$99, \$DB, \$7E, \$18
A0BB	DB	99	DB			
A0BE	7E	18				
A090	66	66	66	CV	BYTE	\$66, \$66, \$66, \$66, \$66, \$2C, \$38, \$30
A093	66	66	2C			
A096	38	30				
A098	00	7C	44	CRHO	BYTE	0, \$7C, \$44, \$44, \$7C, \$6B, \$6C, \$6C
A09B	44	7C	6B			
A09E	6C	6C				
A0A0	00	1C	3E	CTHETA	BYTE	\$00, \$1C, \$3E, \$63, \$5D, \$63, \$3E, \$1C
A0A3	63	5D	63			
A0A6	3E	1C				
A0AB	00	46	46	CK	BYTE	\$00, \$46, \$46, \$44, \$7C, \$64, \$66, \$66
A0AB	44	7C	64			
A0AE	66	66				
A0B0	FE	92	10	CT	BYTE	\$FE, \$92, \$10, \$18, \$18, \$18, \$18, \$18
A0B3	18	18	18			
A0B6	18	18				
A0B8	FC	8C	8C	CC	BYTE	\$FC, \$8C, \$8C, \$80, \$80, \$80, \$84, \$FC
A0BB	80	80	80			
A0BE	84	FC				
A0C0	00	00	00	CHLINE	BYTE	0, 0, 0, 0, 0, 0, 0, \$FF
A0C3	00	00	00			
A0C6	00	FF				
A0C8	80	80	80	CVLINE	BYTE	\$80, \$80, \$80, \$80, \$80, \$80, \$80, \$80
A0CB	80	80	80			
A0CE	80	80				
A0D0	00	00	00	CDOT	BYTE	0, 0, 0, 0, 0, 0, 0, \$80
A0D3	00	00	00			
A0D6	00	80				
A0DB	80	AA	9C	CSBASE	BYTE	\$80, \$AA, \$9C, \$BE, \$9C, \$AA, \$80, \$FF
A0DB	BE	9C	AA			
A0DE	80	FF				
A0E0	80	98	80	CZY2	BYTE	\$80, \$98, \$80, \$B6, \$80, \$8C, \$80, \$FF
A0E3	B6	80	8C			
A0E6	80	FF				
A0E8	80	8E	80	CZY1	BYTE	\$80, \$8E, \$80, \$B8, \$80, \$9C, \$80, \$FF
A0EB	88	80	9C			
A0EE	80	FF				
A0F0	80	B0	98	CZY3	BYTE	\$80, \$B0, \$98, \$BE, \$98, \$80, \$80, \$FF
A0F3	BE	98	B0			
A0F6	80	FF				

ACFB SSCAN
 ACFB 00 00 6C . BYTE 0, 0, \$6C, \$6F \$6E, \$67, 0, \$72, \$61, \$6E, \$67, \$65, 0, \$73, \$63, \$61, \$6E

ACFB 6F 6E 67

ACFB 00 72 61

A101 6E 67 65

A104 00 73 63

A107 61 6E

A109

BACKUP

A109 00 00 00

. BYTE 0, 0, 0, 0, 0, 0, \$61, \$66, \$74, 0, \$76, \$69, \$65, \$77, 0, 0, 0

A10C 00 00 00

A10F 61 66 74

A112 00 76 69

A115 65 77 00

A118 00 00

A11A

GALCHT

A11A 00 00

. BYTE 0, 0

A11C 00 67 61

. BYTE 0, \$67, \$61, \$6C, \$61, \$63, \$74, \$69, \$63, 0, \$63, \$6B, \$61, \$72, \$74, 0

A11F 6C 61 63

A122 74 69 63

A125 00 63 68

A128 61 72 74

A12B 00

A12C 00 00

. BYTE 0, 0

A12E

GLDISP

; GAL CHT DISPLAY LIST

A12E 60 46

. BYTE \$60, \$46

A130 1A A1

. WORD GALCHT

A132 F0 47

. BYTE \$F0, \$47

A134 35 0D

. WORD CHTDIS

A136 07 07 07

. BYTE 7, 7, 7, 7, 7, 7, 7, \$80, \$46

A139 07 07 07

A13C 07 07 80

A13F 46

A140 1F 0D

. WORD MESSAGE

A142 46

. BYTE \$46

A143 71 09

. WORD DGALAC

A145 06 06 41

. BYTE 6, 6, \$41

A148 80 02

. WORD DISPLY

A14A

PHASEB

INIT SECTION

```

A14A          INIT
A14A A9 00    LDA    #00
A14C 8D 0F D2 STA    SKCTL
A14F 85 66    STA    TIMEOUT      ; RESET TIMEOUT
A151 85 62    STA    MISDIF      ; MISSIONDIFFICULTY
A153 85 63    STA    RESET       ; ONE SHOT CONSOL
A155 A9 03    LDA    #03
A157 8D 0F D2 STA    SKCTL      ; TURN POKEY ON

A15A          INIT3      ; GAME SELECT, RESTART POINT *****
A15A A0 2F    LDY    #SENATA-SENTAB

A15C          INIT4      ; ATTRACT MODE RESTART POINT *****
A15C A9 FF    LDA    #$FF      ; GAME OVER

A15E          INIT1      ; GAME START RESTART POINT *****
A15E 84 65    STY    REPMSC
A160 85 64    STA    ATRACT
          CLEAR I/O
A162 A9 00    LDA    #00
A164 AA      TAX
A165          INIT2
A165 9D 00 D0 STA    CTIA,X
A168 9D 00 D4 STA    ANTIC,X
A16B E0 0F    CPX    #0F      ; DONT RESET POKEY
A16D D0 03    BCS    INIT5
A16F 9D 00 D2 STA    POKEY,X
A172          INIT5
A172 9D 00 D3 STA    PIA,X
A175 9D      .BYTE    $9D      ; STA ABS,X
A176 67 00    .WORD    PAGE0    ; STA PAGE0,X (ABSOLUTE)
A178 E8      INX
A179 D0 EA    BNE    INIT2

          I/O CLEARED

A17B CA      DEX      ; X=FF
A17C 9A      TXS      ; LOAD STACK PNTR
A17D D8      CLD

A17E A9 02    LDA    #RAMMAP/256
A180 20 0F AE JSR    CLRMP1      ; CLEAR ALL RAM
          LD VECTOR RAM
A183 A9 51    LDA    #IRGVEC
A185 8D 16 02 STA    VIMIRQ
A188 A9 A7    LDA    #IRGVEC/256
A18A 8D 17 02 STA    VIMIRQ+1
A18D A9 D1    LDA    #VBNMI
A18F 8D 22 02 STA    VVBLKI
A192 A9 18    LDA    #DISNMI
A194 8D 00 02 STA    VDSLST
A197 A9 A6    LDA    #VBNMI/256
A199 8D 23 02 STA    VVBLKI+1
A19C A9 A7    LDA    #DISNMI/256
A19E 8D 01 02 STA    VDSLST+1

```


CONFIGURE PIA

```

A1A1 A9 04      LDA      #104
A1A3 8D 02 D3    STA      PACTL      ; TURN ON JOYSTICK

```

CONFIGURE CTIA

```

A1A5 A9 11      LDA      #11
A1A8 8D 1B D0    STA      PRIOR

A1AB A9 03      LDA      #03
A1AD 8D 1D D0    STA      GRCTL

A1B0 20 BA B3    JSR      LD TABS      ; INIT TABLES

```

INIT DISPLAY LIST

```

A1B3 A2 0A      LDX      #0A      ; KEY F, FRONT DISPLAY
A1B5 20 45 B0    JSR      KEYS15    ; INIT FRONT VIEW
A1B8 A5 64      LDA      ATRACT
A1BA 29 80      AND      #80
A1BC A8         TAY
A1BD A2 5F      LDX      #DISPL3-DISPLY
A1BF A9 08      LDA      #08
A1C1 20 F1 AD    JSR      LDISP      ; SHIP ALIVE OR DEAD

A1C4 A9 20      LDA      #20
A1C6 85 71      STA      WARP      ; WARP 5 SPEED

```

CONFIGURE ANTIC

```

A1C8 A9 80      LDA      #DISPLY
A1CA 8D 02 D4    STA      DLISTL
A1CD A9 02      LDA      #DISPLY/256
A1CF 8D 03 D4    STA      DLISTH
A1D2 A9 3E      LDA      #3E
A1D4 8D 00 D4    STA      DMACTL      ; DMA ON

A1D7 A9 00      LDA      #PGRAPH-0300/256
A1D9 8D 07 D4    STA      PMBASE      ; LD PLAYER / MISSLE BASE

```

INIT NUMBER OF STARS

```

A1DC A9 10      LDA      #STLAST
A1DE 85 79      STA      NSTARS

```

```

A1E0 A6 62      LDX      M1SDIF      ; GAME TYPE MESSAGE
A1E2 BC 0C BF    LDY      MSENTB, X
A1E5 20 23 B2    JSR      LDMESS

```

↑

A1E8 A9 40	LDA	ENABLE INTERRUPTS
A11A 8D 0E D2	STA	#IRGMSK
A1F0 58	CLI	IRGEN
A1EE A9 C0	LDA	, IRQS READY
A1F0 8D 0E D4	STA	#4C0
		NMIEN
		, NMIS READY
		END INIT

MAIN PROGRAM

A1F3

MAIN

MAIN FLOW CHART

START

WAIT FOR VBLANK
 CLEAR AND LOAD STARS/OBJECTS
 MOVE ROUTINES
 PLAYER INTERFACE SECTION
 SERVICE SECTION
 HIT DETECT

GAME ON ONLY
 GAME ON ONLY
 GAME ON ONLY

SERVICE CONTINUOUS RUNNING ROUTINES

JUMP TO START

A1F3 A5 67

LDA PROGST

A1F5 F0 FC

BEG MAIN

; WAIT FOR VBLANK NMI

A1F7 A9 00

LDA #00

; RESET VBLANK STATUS REGISTER

A1F9 B5 67

STA PROGST

UPDATE MEMORY MAP RAM AND PLAYERS RAM

CLRSTR
 CLEAR STAR ROUTINE

A1FB A5 7A

LDA

CNSTAR

; THIS FLAG SAYS OLDPS NOT DEFINED IF=00

A1FD F0 20

BEG

CLRSR2

A1FF A2 04

LDX

#OBLAST

; LAST LOCATION OF OBJECT IN RAM

A201

CLRSR1

A201 E8

INX

A202 BC 5B 0C

LDY

OLDVER, X

A205 B9 00 0B

LDA

VCONL, Y

A208 B5 6B

STA

PNTR

A20A B9 64 0B

LDA

VCONH, Y

A20D B5 69

STA

PNTR+1

A20F BC BC 0C

LDY

OLDHOR, X

A212 BD BD 0C

LDA

OLDBYT, X

A215 91 6B

STA

(PNTR), Y

; BYTE RESTORED

A217 E4 7A

CPX

CNSTAR

A219 90 E6

BCC

CLRSR1

A21B A9 00

LDA

#00

A21D B5 7A

STA

CNSTAR

; STARS CLEARED

A21F

CLRSR2

STOSTR

STORE STAR IN RAM MAP ROUTINE

A21F A5 C0

LDA

HFLAG

; IN HYPER JUMP ?

A221 30 2D

BMI

STOISR1

; YES, NO STORE.

A223 A6 79

LDX

NSTARS ; LAST BYTE OF STAR RAM TO STORE

A225 B6 7A

STX

CNSTAR

; STARS POINTERS DEFINED OK TO CLEAR NOW

A227

STOISR2

MAIN PROGRAM

A1F3

MAIN

MAIN FLOW CHART

START

WAIT FOR VBLANK
 CLEAR AND LOAD STARS/OBJECTS
 MOVE ROUTINES
 PLAYER INTERFACE SECTION
 SERVICE SECTION
 HIT DETECT
 SERVICE CONTINUOUS RUNNING ROUTINES

GAME ON ONLY
 GAME ON ONLY
 GAME ON ONLY

JUMP TO START

A1F3 A5 67
 A1F5 F0 FC
 A1F7 A9 00
 A1F9 85 67

LDA PROGST
 BEQ MAIN
 LDA #00
 STA PROGST

WAIT FOR VBLANK NMI
 RESET VBLANK STATUS REGISTER

UPDATE MEMORY MAP RAM AND PLAYERS RAM

CLRSTR
 CLEAR STAR ROUTINE

A1FB A5 7A
 A1FD F0 20
 A1FF A2 04
 A201

CLRSTR1

CNSTAR ; THIS FLAG SAYS OLDPS NOT DEFINED IF=00
 CLRSR2
 LDX #OBLAST ; LAST LOCATION OF OBJECT IN RAM

A201 E8
 A202 BC 5B 0C
 A205 B9 00 0B
 A208 85 68
 A20A B9 64 0B
 A20D 85 69
 A20F BC 8C 0C
 A212 BD BD 0C
 A215 91 68
 A217 E4 7A
 A219 90 E6
 A21B A9 00
 A21D 85 7A
 A21F

INX
 LDY OLDVER, X
 LDA VCONL, Y
 STA PNTR
 LDA VCONH, Y
 STA PNTR+1
 LDY OLDHOR, X
 LDA OLDBYT, X
 STA (PNTR), Y ; BYTE RESTORED
 CPX CNSTAR
 BCC CLRSR1
 LDA #00
 STA CNSTAR ; STARS CLEARED

CLRSTR2

STOSTR

STORE STAR IN RAM MAP ROUTINE

A21F A5 C0
 A221 30 2D

LDA HFLAG ; IN HYPER JUMP ?
 BMI STOSR1 ; YES, NO STORE.

A220 79
 A221 7A
 A227

STOSR2

LDX NSTARS ; LAST BYTE OF STAR MAP TO STORE
 STX CNSTAR ; STARS POINTERS DEFINED OK TO CLEAR NOW

A227 BD F9 0B	LDA	VPOS, X	
A22A 9D 5B 0C	STA	OLDVER, X	
A22D AB	TAY		
A22E B9 00 0B	LDA	VCONL, Y	
A231 B5 6B	STA	PNTR	
A233 B9 64 0B	LDA	VCONH, Y	
A236 B5 69	STA	PNTR+1	
A238 BD 2A 0C	LDA	HPOS, X	
A23B 4A	LSR	A	
A23C 4A	LSR	A	
A23D 9D BC 0C	STA	OLDHOR, X	
A240 AB	TAY		
A241 B1 6B	LDA	(PNTR), Y	
A243 9D BD 0C	STA	OLDBYT, X	; BYTE SAVED
A246 1D EE 0C	ORA	STRBYT, X	
A249 91 6B	STA	(PNTR), Y	

A24B CA	DEX		
A24C E0 04	CPX	#OBLAST	
A24E D0 D7	BNE	STOSR2	; DO NEXT STAR
A250			
A250 A5 66	LDA	TIMOUT	
A252 10 0E	BPL	STOSR3	
A254 A9 00	LDA	##00	
A256 BD E3 17	STA	NOSTAR	
A259 BD E4 17	STA	NOSTAR+1	
A25C BD BC 17	STA	NOSTAR-39	
A25F BD BB 17	STA	NOSTAR-40	
A262			

STOSR1

STOSR3

CLROBJ
CLEAR OBJECT RAM

OBJECT 4

A262 A9 00	LDA	##00	
A264 AC 5F 0C	LDY	OLDVER+4	
A267 AE C1 0C	LDX	OLDNUM+4	
A26A			
A26A 99 00 03	STA	MGRAPH, Y	
A26D CB	INY		
A26E CA	DEX		
A26F 10 F9	BPL	CLROB1	

CLROB1

CLROB1
OBJECT 3

A271 AC 5E 0C	LDY	OLDVER+3	
A274 AE C0 0C	LDX	OLDNUM+3	
A277			
A277 99 00 07	STA	PGRAPH3, Y	
A27A CB	INY		
A27B CA	DEX		
A27C 10 F9	BPL	CLROB2	

CLROB2

CLROB2
OBJECT 2

A27E AC 5D 0C	LDY	OLDVER+2	
A281 AE BF 0C	LDX	OLDNUM+2	
A284			
A284 99 00 06	STA	PGRAPH2, Y	
A287 CB	INY		
A288 CA	DEX		
A289 10 F9	BPL	CLROB3	

CLROB3

CLROB3
OBJECT 1

A28B AC 5C 0C	LDY	OLDVER+1
A28E AE BE 0C	LDX	OLDNUM+1
A291	CLROB4	
A291 99 00 05	STA	PGRAP1, Y
A294 C8	INY	
A295 CA	DEX	
A296 10 F9	BPL	CLROB4
		OBJECT 0
A298 AC 5B 0C	LDY	OLDVER+0
A29B AE BD 0C	LDX	OLDNUM+0
A29E	CLROB5	
A29E 99 00 04	STA	PGRAP0, Y
A2A1 C8	INY	
A2A2 CA	DEX	
A2A3 10 F9	BPL	CLROB5

STOOBJ
STORE OBJECT ROUTINE

OBJECT 4, ALWAYS PHOTON, OR DOCKING OBJECT

A2A5 AD 90 0C	LDA	GINDEX+4
A2A8 C9 01	CMP	##01
A2AA A4 E8	LDY	GRAPH+4
A2AC AE FD 0B	LDX	VPOS+4
A2AF 8E 5F 0C	STX	OLDVER+4
A2B2 AD F2 0C	LDA	NUMBYT+4
A2B5 85 6A	STA	TEMP
A2B7 BD C1 0C	STA	OLDNUM+4
A2BA	STOJB1	
A2BA B9 E4 B8	LDA	PHGRAF, Y
A2BD B0 03	BCS	STOJB8
A2BF 2D 0A D2	AND	RANDOM
A2C2	STOJB8	
A2C2 9D 00 03	STA	MGRAPH, X
A2C5 C8	INY	
A2C6 E8	INX	
A2C7 C6 6A	DEC	TEMP
A2C9 10 EF	BPL	STOJB1

OBJECT 3, ALWAYS PHOTON

A2CB AD 8F 0C	LDA	GINDEX+3
A2CE C9 01	CMP	##01
A2D0 A4 E7	LDY	GRAPH+3
A2D2 AE FC 0B	LDX	VPOS+3
A2D5 8E 5E 0C	STX	OLDVER+3
A2D8 AD F1 0C	LDA	NUMBYT+3
A2DB 85 6A	STA	TEMP
A2DD BD C0 0C	STA	OLDNUM+3
A2E0	STOJB2	
A2E0 B9 E4 B8	LDA	PHGRAF, Y
A2E3 B0 03	BCS	STOJB9
A2E5 2D 0A D2	AND	RANDOM
A2E8	STOJB9	
A2E8 9D 00 07	STA	PGRAP3, X
A2EB E8	INX	
A2EC C8	INY	
A2ED C6 6A	DEC	TEMP
A2EF 10 EF	BPL	STOJB2

OBJECT 2, (VARIABLE GRAPHIC)

A2F1 AD 8E 0C	LDA	GINDEX+2	
A2F4 C9 01	CMP	#01	DEFINE CARRY
A2F6 A4 E6	LDY	GRAPH+2	
A2F8 AE FB 0B	LDX	VPOS+2	
A2FB 8E 5D 0C	STX	OLDVER+2	
A2FE AD F0 0C	LDA	NUMBYT+2	
A301 85 6A	STA	TEMP	
A303 8D BF 0C	STA	OLDNUM+2	
A306	ST00B3		
A306 B9 E4 B8	LDA	PHGRAF, Y	
A309 B0 03	BCS	ST00B7	
A30B 2D 0A D2	AND	RANDOM	
A30E	ST00B7		
A30E 9D 00 06	STA	PGRAP2, X	
A311 EB	INX		
A312 CB	INY		
A313 C6 6A	DEC	TEMP	
A315 10 EF	BPL	ST00B3	
		OBJECT 1 (VARIABLE)	
A317 A4 E5	LDY	GRAPH+1	
A319 AE FA 0B	LDX	VPOS+1	
A31C BE 5C 0C	STX	OLDVER+1	
A31F AD EF 0C	LDA	NUMBYT+1	
A322 85 6A	STA	TEMP	
A324 BD BE 0C	STA	OLDNUM+1	
A327	ST00B5		
A327 B9 B1 B9	LDA	ZYGRAF, Y	
A32A 9D 00 05	STA	PGRAP1, X	
A32D EB	INX		
A32E CB	INY		
A32F C6 6A	DEC	TEMP	
A331 10 F4	BPL	ST00B5	
		OBJECT 0 (VARIABLE)	
A333 A4 E4	LDY	GRAPH+0	
A335 AE F9 0B	LDX	VPOS+0	
A338 BE 5B 0C	STX	OLDVER+0	
A33B AD EE 0C	LDA	NUMBYT+0	
A33E 85 6A	STA	TEMP	
A340 BD BD 0C	STA	OLDNUM+0	
A343	ST00B6		
A343 B9 B1 B9	LDA	ZYGRAF, Y	
A346 9D 00 04	STA	PGRAP0, X	
A349 EB	INX		
A34A CB	INY		
A34B C6 6A	DEC	TEMP	
A34D 10 F4	BPL	ST00B6	
		UPDATE HORIZ	
A34F AD 2A 0C	LDA	HPOS+0	
A352 8D 00 D0	STA	HPOSP0+0	
A355 AD 2B 0C	LDA	HPOS+1	
A358 8D 01 D0	STA	HPOSP0+1	
A35B AD 2C 0C	LDA	HPOS+2	
A35E 8D 02 D0	STA	HPOSP0+2	
A361 AD 2D 0C	LDA	HPOS+3	
A364 8D 03 D0	STA	HPOSP0+3	
A367 AD 2E 0C	LDA	HPOS+4	
A36A 8D 07 D0	STA	HPOSP0+7	
A36D 1B	CLC		

A36E 69 02	ADC	##02
A370 8D 06 D0	STA	HPOSPO+6
A373 69 02	ADC	##02
A375 8D 05 D0	STA	HPOSPO+5
A378 69 02	ADC	##02
A37A 8D 04 D0	STA	HPOSPO+4

END UPDATE MEMORY MAP RAM AND PLAYERS RAM

STARS/OBJECTS MOVE ROUTINES

A37D 24 D0	BIT	DISFLG	
A37F 30 3A	BMI	MAIN1	; NO ROTATE IN GALACTIC CHART

		YROTAT	
		ROTATE ALL LEFT AND RIGHT	
A381 A5 C8	LDA	HORJOY	; HORIZ JOYSTICK ?
A383 F0 19	BEG	YROTA1	; NO
A385 85 6D	STA	TEMP3	
A387 A4 79	LDY	NSTARS	; LAST BYTE OF STARS
A389	YROTA2		
A389 84 6E	STY	TEMP4	; TEMP STORE
A38B 18	CLC		
A38C 98	TYA		
A38D AA	TAX		
A38E 69 31	ADC	#RAMNUM	; YPOS
A390 A8	TAY		
A391 20 9B B6	JBR	ROHELP	
A394 98	TYA		
A395 AA	TAX		
A396 A4 6E	LDY	TEMP4	
A398 20 9B B6	JBR	ROHELP	
A39B 88	DEY		
A39C 10 EB	BPL	YROTA2	
A39E	YROTA1		

		ZROTAT	
		ROTATE ALL UP AND DOWN	
A39E A5 C9	LDA	VERJOY	; VERT JOYSTICK ?
A3A0 F0 19	BEG	ZROTA1	; NO
A3A2 85 6D	STA	TEMP3	
A3A4 A4 79	LDY	NSTARS	
A3A6	ZROTA2		
A3A6 84 6E	STY	TEMP4	
A3AB 18	CLC		
A3A9 98	TYA		
A3AA AA	TAX		
A3AB 69 62	ADC	#RAMNUM*2	; ZPOS
A3AD A8	TAY		
A3AE 20 9B B6	JBR	ROHELP	
A3B1 98	TYA		
A3B2 AA	TAX		
A3B3 A4 6E	LDY	TEMP4	
A3B5 20 9B B6	JBR	ROHELP	
A3B8 88	DEY		

A3B9 10 EB
A3BB

BPL ZROTA2

ZROTA1

A3BB

MAIN1

XMOVE

UPDATE ALL XPOS DUE TO FORWARD SHIP MOTION

SUBTRACT SPEED FROM XPOS

NSTARS ; X=INDEX TO STARS/POBJECT TO UPDATE

A3BB A6 79

LDX

A3BD

XMOVE1

A3BD E0 05

CPX

#OBJNUM

; PHOTONS ?

A3BF B0 05

BCS

XMOVE2

; NO.

A3C1 BD BC 0C

LDA

GINDEX, X

A3C4 F0 19

BEQ

XMOVE3

A3C6

XMOVE2

A3C6 38

SEC

A3C7 BD D3 0A

LDA

XPSL, X

A3CA E5 70

SBC

SPEED

A3CC 9D D3 0A

STA

XPSL, X

A3CF BD 40 0A

LDA

XPSH, X

A3D2 E5 C1

SBC

HISPED

A3D4 9D 40 0A

STA

XPSH, X

A3D7 BD AD 09

LDA

XSIGN, X

A3DA E9 00

SBC

#00

; CARRY ONLY

A3DC 9D AD 09

STA

XSIGN, X

A3DF

XMOVE3

A3DF CA

DEX

A3EO 10 DB

BPL

XMOVE1

; NEXT STAR

ALL DONE

MOTION

OTHER MOTION SUCH AS DUE TO ZYLON SHIP POWER

OR PHOTONS

XINC, YINC, ZINC ARE ALL SIGN-MAGNITUDE TYPES

A3E2 A6 79

LDX

NSTARS

A3E4

MOTIN1

A3E4 E0 10

CPX

#STLAST

; REG STARS ?

A3E6 D0 02

BNE

MOTIN9

; NO.

A3E8 A2 04

LDX

#OBLAST

; LAST OBJ

A3EA

MOTIN9

A3EA 8A

TXA

A3EB

MOTIN2

A3EB A8

TAY

A3EC A9 00

LDA

#00

A3EE 85 6B

STA

TEMP1

A3FO B9 66 0B

LDA

XINC, Y

A3F3 10 09

BPL

MOTIN3

A3F5 49 7F

EOR

#7F

A3F7 18

CLC

A3FB 69 01

ADC

#01

A3FA B0 02

BCS

MOTIN3

A3FC C6 6B

DEC

TEMP1

A3FE

MOTIN3

A3FE 18

CLC

A3FF 79 D3 0A

ADC

XPSL, Y

A402 99 D3 0A

STA

XPSL, Y

A405 B9 40 0A

LDA

XPSH, Y

```

A408 65 6B      ADC      TEMP1
A40A 99 40 0A    STA      XPOSH, Y
A40C 89 AD 09    LDA      XSIGN, Y
A410 65 6B      ADC      TEMP1
A412 99 AD 09    STA      XSIGN, Y

A415 9B          TYA
A416 1B          CLC
A417 69 31      ADC      #RAMNUM
A419 C9 90      CMP      #RMLAST*3      ; ALL DONE ?
A41B 90 CE      BCC      MOTIN2        ; NO
A41D CA          DEX
A41E 10 C4      BPL      MOTIN1        ; NEXT STAR OR OBJECT

```

BOUNDS

```

A420 A0 04      LDY      #OBLAST      ; ONLY OBJECTS
A422            BOUND1
A422 9B          TYA
A423 AA          TAX
A424 A9 02      LDA      #02
A426 B5 6A      STA      TEMP
A428            BOUND3
A42B BD AD 09    LDA      XSIGN, X
A42B C9 02      CMP      #02
A42D 90 10      BCC      BOUND4
                        OUT OF BOUNDS

A42F 0A          ASL      A
A430 A9 00      LDA      #00
A432 9D AD 09    STA      XSIGN, X
A435 B0 05      BCS      BOUND5
A437 FE AD 09    INC      XSIGN, X
A43A 49 FF      EOR      #FF
A43C            BOUND5
A43C 9D 40 0A    STA      XPOSH, X
A43F            BOUND4
A43F 8A          TXA
A440 1B          CLC
A441 69 31      ADC      #RAMNUM
A443 AA          TAX
A444 C6 6A      DEC      TEMP
A446 10 E0      BPL      BOUND3
A448 8B          DEY
A449 10 D7      BPL      BOUND1        ; NEXT STAR

```

CALCVH

CALCULATE V, H POS FOR ALL STARS/OBJ

```

A44B A5 D0      LDA      DISFLG
A44D C9 02      CMP      #02
A44F B0 5C      BCS      CALC14      ; NOT FRONT OR BACK

A451 A6 79      LDX      NSTARS      ; X=INDEX OF STARS
A453            CALCV1      ; STAR LOOP
A453 A9 FF      LDA      #FF
A455 BC AD 09    LDY      XSIGN, X

```


A45B C4 D0
A45A F0 4B

CPY
BEQ

DISFLG
CALCV5

UPDATE VPOS

A45C BD OF 0A
A45F D0 12

LDA
BNE

ZSIGN, X ; 2'S COMPLE ZPOS?
CALCV8 ; NO
2'S COMPLEMENT

A461 3B
A462 A9 00
A464 FD 35 0B
A467 B5 6A
A469 A9 00
A46B FD A2 0A

SEC
LDA
SBC
STA
LDA
SBC
STA
JMP

#\$00
ZPSL, X
TEMP
#\$00
ZPOSH, X
TEMP1
CALCV9

A46E B5 6B
A470 4C 7D A4
A473

CALCV8

A473 BD 35 0B
A476 B5 6A
A47B BD A2 0A
A47B B5 6B
A47D

LDA
STA
LDA
STA

ZPSL, X
TEMP ; STORE IN TOP REG
ZPOSH, X
TEMP1

CALCV9

A47D 20 21 AA
A480 20 1E B7

JSR
JSR

DIVIDE ; DIVIDE ZPOS BY XPOS
STVPOS ; STOE VPD

UPDATE HORIZ POS

A483 BD DE 09
A486 D0 12

LDA
BNE

YSIGN, X ; 2'S COMPLE YPOS ?
CALCV3 ; NO
2'S COMPLEMENT

A488 3B
A489 A9 00
A48B FD 04 0B
A48E B5 6A
A490 A9 00
A492 FD 71 0A
A495 B5 6B

SEC
LDA
SBC
STA
LDA
SBC
STA
JMP

#\$00
YPSL, X
TEMP ; STORE IN TOP (NUMERATOR) REG
#\$00
YPOSH, X
TEMP1
CALCV4

A497 4C A4 A4
A49A
A49A BD 04 0B
A49D B5 6A
A49F BD 71 0A
A4A2 B5 6B

CALCV3

LDA
STA
LDA
STA

YPSL, X ; SOTRE IN TOP REG
TEMP
YPOSH, X
TEMP1

CALCV4

A4A4
A4A4 20 21 AA
A4A7

CALCV5

JSR
JSR

DIVIDE ; DIVIDE YPOS BY XPOS
STHPOS ; STORE HPOS

A4AA CA
A4AB 10 A6

DEX
BPL

CALCV1 ; NEXT STAR
ALL DONE

A4AD ; CALC14

A4AD 20 62 B1

JSR

Cserve ; SERVICE GALACTIC CHART

SSERVE

ADDRESS	DATA	OPERATION	COMMENT
A4B0	24 D0	BIT	DISFLO
A4B2	50 31	BVC	SSERV1
A4B4	A2 31	LDX	#INSTB2-INSTAB ; LOAD SECTOR SCAN SHIP
A4B6	20 6F A7	JSR	LDINST
A4B9	2C 96 09	BIT	DAMAGE+4 ; SECTOR SCAN DAMAGE
A4BC	70 27	BVS	SSERV1

A4BE	A6	79	LDX	NSTARS
A4C0			SSERV2	
A4C0	BD	40 0A	LDA	XPOSH, X
A4C3	BC	AD 09	LDY	XSIGN, X
A4C6	DO	02	BNE	SSERV3
A4C8	49	FF	EDR	##FF
A4CA			SSERV3	
A4CA	AB		TAY	

A4CB	B9	E9	OD	LDA	PTAB, Y
A4CE	20	1E	B7	JSR	STVPOS
A4D1	BD	71	0A	LDA	YPOSH, X
A4D4	BC	DE	09	LDY	YSIGN, X
A4D7	D0	02		BNE	SSERV4
A4D9	49	FF		EOR	##FF

A4DB SSERV4
A4DB A8 TAY

A4DC	B9	E9	OD	LDA	PTAB, Y
A4DF	20	FB	B6	JSR	STHPOS
A4E2	CA			DEX	
A4E3	10	DB		BPL	SSERV2
A4E5			SSERV1		

[illegible]

A510 E0 02	CPX	##02	; SBASE OBJECTS ?
A512 B0 16	BCS	OBJCL8	; NO
A514 AD 2C 0C	LDA	HPOS+2	; GANG OBJ 0,1,2 TOGETHER
A517 1B	CLC		; OBJ 2 IS REFERENCE
A518 7D DB BE	ADC	BHORB,X	; HORIZ OFFSET, +B,-B
A51B 9D 2A 0C	STA	HPOS,X	
A51E AD FB 0B	LDA	VPOS+2	; GANG VPOS
A521 1B	CLC		
A522 69 04	ADC	#4	
A524 9D F9 0B	STA	VPOS,X	
A527 AC 42 0A	LDY	XPOSH+2	; ALL USE OBJ2 POSIT.
A52A	OBJCLB		
A52A A5 76	LDA	BINTIM	; MODULATE STARBASE COLOR
A52C 29 0F	AND	##0F	
A52E	OBJCL6		
A52E B5 6B	STA	TEMP1	; COLOR MODULATE
A530 9B	TYA		; XPOSH
A531 BC F9 0B	LDY	VPOS,X	; IN BOUNDS CHECK
A534 C0 CC	CPY	##CC	; IN BOUNDS ?
A536 B0 AF	BCS	OBJCL2	; NO
A53B A4 D0	LDY	DISFLG	; FRONT OR BACK ?
A53A F0 02	BEQ	OBJCL7	; FRONT
A53C 49 FF	EOR	##FF	; ONES COMPLEMENT XPOSH
A53E	OBJCL7		
A53E C9 20	CMP	##20	; TOO FAR AWAY ?
A540 B0 A5	BCS	OBJCL2	; YES
A542 C9 10	CMP	##10	; SMALLEST SIZE ?
A544 90 02	BCC	OBJCL5	; NO
A546 A9 0F	LDA	##0F	; SMALL SIZE
A548	OBJCL5		
A548 B5 6A	STA	TEMP	; LD COLOR, GRAPHIC PNTRB
A54A 1D BC 0C	ORA	GINDEX,X	; TEMP SAVE XPOSH
A54D 4A	LSR	A	; TYPE OF GRAPHIC
A54E A8	TAY		; ONLY 8 VALUES PER TYPE
A54F B9 2F BE	LDA	GPOINT,Y	; OFFSET FROM PHGRAF, OR ZYGRAF
A552 95 E4	STA	GRAPH,X	; HOLDS INDEX
A554 B9 7F BE	LDA	NBYTAB,Y	
A557 9D EE 0C	STA	NUMBYT,X	; NUMBER OF BYTES TO SAVE
A55A 9B	TYA		
A55B 4A	LSR	A	
A55C 4A	LSR	A	
A55D 4A	LSR	A	
A55E A8	TAY		; GINDEX ONLY
A55F B9 D1 BF	LDA	COLTAB,Y	; CHROMA OF OBJ
A562 C0 0B	CPY	##0B	; BASE STAR ?
A564 D0 03	BNE	OBJC11	; NO
A566 4D 0A D2	EOR	RANDOM	; RANDOM COLOR
A569	OBJC11		
A569 A4 6A	LDY	TEMP	; DISTANCE FOR INTENSITY
A56B 59 DB BF	EOR	COLINT,Y	; INTENSITY
A56E 45 6B	EOR	TEMP1	; COLOR MODULATE, IF ANY
A570 BC DF B8	LDY	CLINDX,X	; WHERE TO STORE
A573 99 EE 00	STA	COLRAM,Y	; COLOR UPDATED
A576 4C E7 A4	JMP	OBJCL2	; NEXT OBJ
A579	OBJC12		

STRBRT
STAR BIRGHTNESS INTENSITY NEW STAR CALC

A579 A0 AF LDY #BRTBLU

A57B A6 B1	LDX	SPABAK	
A57D A5 B8	LDA	REDFLG	
A57F F0 0C	BEQ	STRBR2	
A581 C6 B8	DEC	REDFLG	; TIME OUT RED ALERT
A583 A0 4F	LDY	#DRTRED	
A585 29 20	AND	##20	
A587 F0 04	BEQ	STRBR2	
A589 A2 42	LDX	#DIMRED	
A58B A0 60	LDY	#DRKRED	
A58D	STRBR2		
A58D 84 F4	STY	COLRAM+6	; PF2
A58F 86 F6	STX	COLRAM+8	; BAK
A591 A6 79	LDX	NSTARS	; X=INDWX , INIT TO LAST STAR
A593	STRBR1		
A593 BD 40 0A	LDA	XPOSH, X	; INTENSITY DETERMINED BY XPOS
A596 A4 D0	LDY	DISFLG	; FRONT OR BACK ?
A598 C0 01	CPY	##01	; ALL BUT BACK VIEW WILL BRANCH
A59A D0 09	BNE	STRBR5	; FRONT
A59C C9 F0	CMP	##F0	; STAR AT MINUS BOUNDS ?
A59E B0 03	BCS	STRBR4	
A5A0 20 64 B7	JSR	NEWSTR	
A5A3	STRBR6		
A5A3 49 FF	EOR	##FF	; COMPLEMENT XPOS
A5A5	STRBR5		
A5A5 C9 10	CMP	##10	; USE DEFAULT ?
A5A7 90 02	BCC	STRBR4	; NO
A5A9 A9 0F	LDA	##0F	; DEFAULT
A5AB	STRBR4		
A5AB 0A	ASL	A	
A5AC 29 1C	AND	##1C	
A5AE 05 72	ORA	TIMERX	; MULTIPLEX WITH FRAME COUNT
A5B0 AB	TAY		; FOR 8 APPARENT LEVELS OF BRIGHT
A5B1 B9 90 BA	LDA	BRTABL, Y	; WHICH PLAYFIELD
A5B4 85 6A	STA	TEMP	
A5B6 BD 2A 0C	LDA	HPOS, X	
A5B9 29 03	AND	##03	
A5BB AB	TAY		
A5BC B9 B0 BA	LDA	MASK, Y	
A5BF 25 6A	AND	TEMP	
A5C1 9D EE 0C	STA	STRBYT, X	; DATA TO STORE IN STOSTR
A5C4 CA	DEX		
A5C5 E0 05	CPX	#OBJNUM	; ALL DONE WITH STARS ?
A5C7 B0 CA	BCS	STRBR1	; NEXT STAR
			ALL DONE

END STAR/OBJECTS MOVE ROUTINES

GAME ON ROUTINES

PLAYER INTERFACE SECTION AND SERVICE SECTION, HIT DETECT

A5C9	24	64	BIT	ATRACT	;	GAME OVER LOCKOUT PLAYER
A5CB	50	03	BVC	MAIN4	;	YES
A5CD	4C	9B	A6	JMP	MAIN3	
A5D0				MAIN4		
A5D0	20	FE	AF	JSR	KEYSRV	;
				JOYSTK		SERVICE KEYBOARD

A5EA 20 3D AF	JSR	HITZYL	HIT ZYLON
A5ED 20 29 AE	JSR	PHOTON	SERVICE TRIGGERS

ASERVE
ATTACK COMPUTER SERVICE

A5F0	2C	95	09	BIT	DAMAGE+3	
A5F3	70	40		BVS	ASERV2	
A5F5	A5	7E		LDA	ATENER	ATTACK ON ?
A5F7	F0	3C		BEQ	ASERV2	NO

A5F7	10	00	---	---
A5F9	A5	D0	LDA	DISFLQ
A5FB	D0	03	BNE	ASERV1
A5FD	20	BF A7	JSR	UP INST

A600 ASERV1

AUTO TARGET SELECTOR

A600	AE	5C	09	LDX	DCSTOR
A603	A5	BF		LDA	ATTARG
A605	30	05		BMI	ASERV4
A607	AA			TAX	
A608	09	80		ORA	##80
A60A	B5	BF		STA	ATTARG
A60C			ASERV4		
A60C	B5	E9		LDA	STFLAG, X
A60E	D0	0B		BNE	ASERV3
A610	8A			TXA	
A611	49	01		EOR	##01
A613	AA			TAX	
A614	B5	E9		LDA	STFLAG, X
A616	D0	03		BNE	ASERV3
A618	AE	5C	09	LDX	DCSTOR
A61B			ASERV3		
A61B	8E	5C	09	STX	DCSTOR

COMPUTER AUTO TRACKING

A61E	A5	7C	LDA	TRKFLG	
A620	F0	13	BEG	ASERV2	
A622	A5	D0	LDA	DISFLG	
A624	C9	02	CMP	##02	; FRONT OR BAK ?
A626	B0	0D	BCS	ASERV2	; NO
A628	49	01	EOR	##01	; WHICH DISFLG
A62A	DD	AD 09	CMP	XSIGN,X	; OBJ IN SIGHT ?
A62D	F0	06	BEG	ASERV2	; YES
A62F	AA		TAX		
A630	BD	CF BE	LDA	TRKTAB,X	; WHICH KEY FOR SWITCHING DISPLAY
A633	85	CA	STA	THEKEY	; SWITCH DISPLAY

A635

ASERV2

A635 20 E6 AC

JSR

BSERVE

; SERVICE STARBASE

A63B 20 79 AA

JSR

THINK

; SERVICE ZYLON BRAIN

HITSHP

RAIDER HIT PHOTON HIT DETECT

A63B A5 7B

LDA

BASFLG

; STARBASE ?

A63D D0 5C

BNE

HITSH1

; YES

A63F A5 EB

LDA

STFLAG+2

A641 F0 5B

BEQ

HITSH1

A643 AC 42 0A

LDY

XPOSH+2

A646 CB

INY

A647 C0 02

CPY

#02

A649 B0 50

BCS

HITSH1

A64B AC 73 0A

LDY

YPOSH+2

A64E CB

INY

A64F C0 02

CPY

#02

A651 B0 4B

BCS

HITSH1

A653 AC A4 0A

LDY

ZPOSH+2

A656 CB

INY

A657 C0 02

CPY

#02

A659 B0 40

BCS

HITSH1

A HIT !!

A65B 20 E1 AE

JSR

DAMCTL

A65E A0 02

LDY

#02

A660 20 6B AC

JSR

EXPLOS

A663 A2 7F

LDX

#07F

A665 A5 81

LDA

SPABAK

; DEAD ?

A667 D0 1E

BNE

HITSH2

; NO

A669 A2 0A

LDX

#0A

; FRONT

A66B 20 45 B0

JSR

KEYS15

A66E A0 23

LDY

#SENDST-SENTAB

A670 A2 0B

LDX

#0B

; DESTROYED

A672 20 0A B1

JSR

CRATE

A675 A2 5F

LDX

#DISPL3-DISPLY

A677 A0 B0

LDY

#0B

A679 A9 0B

LDA

#0B

A67B 20 F1 AD

JSR

LDISP

A67E 20 0D AE

JSR

CLRMAP

A681 A2 40

LDX

#040

; ITS ALL OVER

A683 86 E3

STX

BIGEXP

A685 A2 FF

LDX

#0FF

; HIT ME DEAD

A687

HITSH2

A687 86 8A

STX

HITME

A689 A9 00

LDA

#00

A68B 85 EB

STA

STFLAG+2

A68D A9 02

LDA

#02

A68F 85 BE

STA

PHEXWT

A691 A2 01

LDX

#01

A693 20 6F BB

JSR

PANDS6

A696 A2 0A

LDX

#NOITB1-NOISTB

A698 20 AB AE

JSR

NOISE

A69B

HITSH1

END GAME ON ROUTINES

A69B

MAIN3

SERVICE CONSOL ROUTINE

CONSR2

END CONTINUOUS RUNNING ROUTINES

```
END VBLANK ROUTINE, WAIT FOR NEW VBLANK
```

NMI INTERRUPT SERVICE SECTION

```

A6D1          VBNMI
A6D1 A9 FF    LDA    #FF
A6D3 B5 67    STA    PROGST          ; SET PROGST VBLANK NMI FLAG
A6D5 A9 E0    LDA    #ALPHA/256
A6D7 BD 09 D4 STA    CHBASE          ; USE STANDARD ALPHA CHARACTERS
A6DA A6 F6    LDX    COLRAM+8        ; BAK
A6DC AD 0A D2 LDA    RANDOM
A6DF 24 8A    BIT    HITME
A6E1 50 07    BVC    VBLNK4
A6E3 30 04    BMI    VBLNK1
A6E5 29 72    AND    #$72
A6E7 09 40    ORA    #$40
A6E9          VBLNK1
A6E9 AA       TAX
A6EA          VBLNK4
A6EA A5 D0    LDA    DISFLG
A6EC C9 03    CMP    #$03
A6EE 90 02    BCC    VBLNK2
A6F0 A2 A0    LDX    #DBLUE
A6F2          VBLNK2
A6F2 B6 F6    STX    COLRAM+8        ; BAK
A6F4 A2 08    LDX    #$08
A6F6          VBLNK3
A6F6 B5 EE    LDA    COLRAM+0, X
A6FB 9D 12 D0 STA    COLPM0, X
A6FB CA       DEX
A6FC 10 FB    BPL    VBLNK3

;
;
A6FE BD 1E D0 STA    HITCLR          ; RESET HITS
A701 20 AB B2 JSR    AUDIO          ; SERVICE AUDIO

A704 E6 77    INC    BINNMI          ; ATTRACT MODE STUFF
A706 D0 0D    BNE    VBLNK5
A708 A5 66    LDA    TIMOUT
A70A 30 09    BMI    VBLNK5
A70C E6 66    INC    TIMOUT
A70E 10 05    BPL    VBLNK5
A710 A0 00    LDY    #$00
A712 4C 5C A1 JMP    INIT4
A715          VBLNK5

;
;
A715 4C 4B A7 JMP    POPALL

;
A718          DISNMI
A718 48       PHA          ; PUSH ALL REGISTERS FOR OP SYSTEM
A719 8A       TXA
A71A 48       PHA
A71B 98       TYA
A71C 48       PHA
A71D A9 E0    LDA    #ALPHA/256
A71F AC 0B D4 LDY    VCOUNT
A722 C0 60    CPY    #$60

```

A724 F0 02		BEG	DISNM1	
A726 A9 A0		LDA	#CGRAPH/256	
A728	DISNM1			
A72B 8D 09 D4		STA	CHBASE	USE FUTURE TYPE CHARACTER SET
A72B A2 04		LDX	#04	
A72D 8D 0A D4		STA	WSYNC	
A730	DISNM2			
A730 B5 F7		LDA	COLRAM+9, X	
A732 9D 16 D0		STA	COLPFO, X	
A735 CA		DEX		
A736 10 FB		BPL	DISNM2	
			READ HITS	
A73B AD 0B D0		LDA	M0PL	
A73B 0D 09 D0		ORA	M1PL	
A73E 0D 0A D0		ORA	M2PL	
A741 0D 0B D0		ORA	M3PL	
A744 B5 B3		STA	PHITS+1	PHOTON 3 STORED
A746 AD 0F D0		LDA	P3PL	
A749 B5 B2		STA	PHITS+0	PHOTON 2 STORED
A74B	POPALL			
A74B 68		PLA		
A74C A8		TAY		
A74D 68		PLA		
A74E AA		TAX		
A74F 68		PLA		

END POP

A750 40		RTI		
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IRQ INTERRUPT SERVICE SECTION

A751 IRGVEC

PUSH ACCUM REGISTERS

A751 48

PHA

END PUSH

A752 A9 00

LDA #\$00

A754 8D 0E D2

STA IRGEN ; RESET IRQ'S

A757 A9 40

LDA #IRGMSK

A759 8D 0E D2

STA IRGEN

A75C AD 09 D2

LDA KBCCODE

A75F 09 C0

ORA #\$C0

A761 85 CA

STA THEKEY

A763 68

PLA

A764 40

RTI

END IRQ INTERRUPT SECTION

SUBROUTINES;

A765		LDINS5	LOAD OF THE LINE
A765	99 A4 00	STA	NUMPTS, Y
A766	E8	INX	
A767	88	DEY	
A76A	10 0E	BPL	LDINS4
A76C	20 82 A7	JSR	DRAWER
A76F		LDINST	
			LOAD INSET RESERVE BYTE=\$FE
			X= INITIAL START OF PNTR IN INSTAB
A76F	A9 05	LDA	##05
A771	85 A2	STA	TARPTR
A773	2C 95 09	BIT	DAMAGE+3
A776	70 09	BVS	LDINS2
A77B		LDINS1	
A77B	A0 02	LDY	##02
A77A		LDINS4	
A77A	BD F9 BA	LDA	INSTAB, X
A77D	C9 FE	CMP	##FE
A77F	D0 E4	BNE	LDINS6
A781		LDINS2	
A781	60	RTS	
A782		DRAWER	DRAW THE LINE
A782	A9 55	LDA	##55
A784		DRAWR3	ENTRY POINT FROM UPINST *****
A784	85 6B	STA	TEMP1
A786	A5 A4	LDA	NUMPTS
A788	85 6E	STA	TEMP4
A78A	29 7F	AND	##7F
A78C	85 A4	STA	NUMPTS
A78E		DRAWR1	
A78E	A4 A5	LDY	VDRAW
A790	B9 00 0B	LDA	VCONL, Y
A793	85 68	STA	PNTR
A795	B9 64 0B	LDA	VCONH, Y
A798	85 69	STA	PNTR+1
A79A	A5 A6	LDA	HDRAW
A79C	4A	LSR	A
A79D	4A	LSR	A
A79E	85 6A	STA	TEMP
A7A0	A5 A6	LDA	HDRAW
A7A2	29 03	AND	##03
A7A4	AB	TAY	
A7A5	B9 B0 BA	LDA	MASK, Y
A7A8	25 6B	AND	TEMP1
A7AA	A4 6A	LDY	TEMP
A7AC	11 68	ORA	(PNTR), Y
A7AE	91 68	STA	(PNTR), Y
A7B0	24 6E	BIT	TEMP4
A7B2	10 04	BPL	DRAWR4
A7B4	E6 A5	INC	VDRAW
A7B6	D0 02	BNE	DRAWR5
A7B8		DRAWR4	
A7B8	E6 A6	INC	HDRAW
A7BA		DRAWR5	

A7BA C6 A4	DEC	NUMPTS	POINTS ALL DRAWN ?
A7BC D0 D0	BNE	DRAWR1	
A7BE	DRAWR2		
A7BF 60	RTS		

A7BF	UPINST	UPDATE	INSET
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A7BF AE 5C 09	LDX	FIRE CONTROL	
A7C2 A4 A2	LDY	DCSTOR	WHICH OBJECT
A7C4 C0 05	CPY	TARPTR	
A7C6 B0 24	BCS	##05	

		UPINS2	
		LD TARGET DISPLAY	
A7C8 A5 A0	LDA	HTARGET	
A7CA B5 A6	STA	HDRAW	
A7CC B9 6E BF	LDA	ZYTARG, Y	

A7CF	UPINS8		
A7CF 0A	ASL	A	
A7D0 B5 6C	STA	TEMP2	
A7D2 90 0D	BCC	UPINS9	
A7D4 A9 B1	LDA	##B1	
A7D6 B5 A4	STA	NUMPTS	
A7D8 A5 A1	LDA	VTARGET	
A7DA B5 A5	STA	VDRAW	
A7DC A9 AA	LDA	##AA	

A7DE 20 B4 A7	JSR	DRAWR3	
A7E1	UPINS9		
A7E1 E6 A6	INC	HDRAW	
A7E3 A5 6C	LDA	TEMP2	
A7E5 D0 E8	BNE	UPINS8	
A7E7 E6 A1	INC	VTARGET	

A7E9	UPIN10		
A7E9 E6 A2	INC	TARPTR	
A7EB 60	RTS		

A7EC	UPINS2		
A7EC C0 0A	CPY	##0A	
A7EE 90 F9	BCC	UPIN10	
A7F0 B5 E9	LDA	STFLAG, X	
A7F2 F0 3C	BEQ	UPINS3	
A7F4 BD 71 0A	LDA	YPOSH, X	
A7F7 BC DE 09	LDY	YSIGN, X	
A7FA F0 08	BEQ	UPINS4	
A7FC C9 0C	CMP	##0C	
A7FE 90 0A	BCC	UPINS5	
AB00 A9 0B	LDA	##0B	
AB02 10 06	BPL	UPINS5	JUMP

AB04	UPINS4		
AB04 C9 F5	CMP	##F5	
AB06 B0 02	BCS	UPINS5	
AB08 A9 F5	LDA	##F5	

AB0A	UPINS5		
AB0A 18	CLC		
AB0B 69 B3	ADC	#131	
AB0D B5 A0	STA	HTARGET	
AB0F BD A2 0A	LDA	ZPOSH, X	
AB12 49 FF	EOR	##FF	

AB14 BC 0F 0A	LDY	ZSIGN, X
AB17 D0 08	BNE	UPINS6
AB19 C9 05	CMP	##05
AB1B 90 0A	BCC	UPINS7
AB1D A9 04	LDA	##04
AB1F 10 06	BPL	UPINS7, JUMP
AB21	UPINS6	
AB21 C9 FA	CMP	##FA
AB23 B0 02	BCS	UPINS7
AB25 A9 FA	LDA	##FA
AB27	UPINS7	
AB27 18	CLC	
AB2B 69 4D	ADC	#77
AB2A B5 A1	STA	VTARGET
AB2C A9 00	LDA	##00
AB2E B5 A2	STA	TARPTR
AB30	UPINS3	
		CLEAR INSET
AB30 A9 36	LDA	#INSET
AB32 B5 6B	STA	PNTR
AB34 A9 1B	LDA	#INSET/256
AB36 B5 69	STA	PNTR+1
AB3B A2 0E	LDX	#14
AB3A	UPIN12	
AB3A A0 06	LDY	##06
AB3C	UPIN13	
AB3C B1 6B	LDA	(PNTR), Y
AB3E 29 55	AND	##55
AB40 91 6B	STA	(PNTR), Y
AB42 8B	DEY	
AB43 10 F7	BPL	UPIN13
AB45 1B	CLC	
AB46 A5 6B	LDA	PNTR
AB4B 69 2B	ADC	#40
AB4A B5 6B	STA	PNTR
AB4C 90 02	BCC	UPIN14
AB4E E6 69	INC	PNTR+1
AB50	UPIN14	
AB50 CA	DEX	
AB51 10 E7	BPL	UPIN12
		DONE CLEAR INSET
AB53 AE 5C 09	LDX	DCSTOR
AB56 C8	INY	Y=0
AB57 A5 8B	LDA	LOKWAT
AB59 F0 04	BEG	UPIN11
AB5B C6 8B	DEC	LOKWAT
AB5D D0 39	BNE	UPINS1
AB5F	UPIN11	
AB5F A5 A0	LDA	HTARGET
AB61 C9 B1	CMP	#129
AB63 90 33	BCC	UPINS1
AB65 C9 B5	CMP	#133
AB67 B0 2F	BCS	UPINS1
AB69 A9 AA	LDA	##AA
AB6B BD FE 1B	STA	ICON2
AB6E BD 04 1C	STA	ICON2+6
AB71 A5 A1	LDA	VTARGET
AB73 C9 4B	CMP	#75
AB75 90 21	BCC	UPINS1
AB77 C9 4F	CMP	#79

A879 B0 1D	BCS	UPINS1
A87B A9 AA	LDA	#\$AA
A87D 8D 9E 1C	STA	ICON2+160
A880 8D A4 1C	STA	ICON2+166
A883 8D 10 0A	LDA	XPOSH,X
A886 C9 0C	CMP	#\$0C
A888 B0 0E	BCS	UPINS1
A88A A0 A0	LDY	#\$A0
A88C 8C 40 1D	STY	ICON1
A88F 8C 68 1D	STY	ICON1+40
A892 8C 42 1D	STY	ICON1+2
A895 8C 6A 1D	STY	ICON1+42
A898	UPINS1	
A89B 84 A3	STY	LOKFLG
A89A 60	RTS	

A89B	HSERVE	
------	--------	--

HYPERWARP SERVICE ROUTINE

A89B A4 C0	LDY	HFLAG	HWARP ?
A89D F0 61	BEQ	HSERV4	NO
A89F A5 70	LDA	SPEED	
A8A1 C9 FE	CMP	#\$FE	UP TO SPEED ?
A8A3 B0 5C	BCS	HSERV5	YES
A8A5 C9 80	CMP	#\$80	DO LINES ?
A8A7 90 03	BCC	HSERV6	NO
A8A9 20 B4 A9	JSR	HLINE5	
A8AC	HSERV6		

STEERING STUFF

A8AC A9 03	LDA	#\$03
A8AE 8D 5C 09	STA	DCSTOR
A8B1 A9 90	LDA	#\$90
A8B3 8D 8F 0C	STA	GINDEX+3
A8B6 85 EC	STA	STFLAG+3
A8B8 A9 1F	LDA	#\$1F
A8BA 8D 43 0A	STA	XPOSH+3
A8BD 38	SEC	
A8BE AD FC 0B	LDA	VPOS+3
A8C1 E9 77	SBC	#VBOCEN-3
A8C3 18	CLC	
A8C4 65 C5	ADC	VSTEER
A8C6 29 7F	AND	#\$7F
A8C8 85 8E	STA	HYVPOS
A8CA 38	SEC	
A8CB AD 2D 0C	LDA	HPOS+3
A8CE E9 7D	SBC	#HBOCEN
A8D0 18	CLC	
A8D1 65 C4	ADC	HSTEER
A8D3 29 7F	AND	#\$7F
A8D5 85 8F	STA	HYHPOS
A8D7 A5 62	LDA	MISDIF
A8D9 F0 11	BEQ	HSERV7
A8DB AD 0A D2	LDA	RANDOM
A8DE A4 D0	LDY	DISFLG
A8E0 F0 06	BEQ	HSERV9
A8E2 8D 2D 0C	STA	HPOS+3

A8E9 BD FC 0B	STA	VPOS+3	
A8E8	HSERV9		
A8EB C9 10	CMP	##10	
A8EA B0 14	BCS	HSERV4	
A8EC	HSERV7		
A8EC AD 0A D2	LDA	RANDOM	
A8EF 09 10	DRA	##10	
A8F1 25 C6	AND	STERMK	
A8F3 BD 9A 0B	STA	YINCRE+3	
A8F6 AD 0A D2	LDA	RANDOM	
A8F9 09 10	DRA	##10	
A8FB 25 C6	AND	STERMK	
A8FD BD CB 0B	STA	ZINCRE+3	
A900	HSERV4		
A900 60	RTS		
A901	HSERV5		
A901 98	TYA		; IN JUMP ?
A902 30 11	BMI	HSERV8	; YES
		BEGIN JUMP	
A904 A9 FF	LDA	##FF	
A906 B5 C0	STA	HFLAG	
A908 A2 00	LDX	#CH4TB1-CH4TAB	
A90A 20 A6 B3	JSR	NOTINT	
A90D 20 A7 B1	JSR	CSERV8	; JUMP ENERGY
A910 A0 1B	LDY	#SENHSP-SENTAB	
A912 4C BD A9	JMP	HABOR1	
A915	HSERV8		; IN JUMP
A915 C6 91	DEC	HYPENG	; ALL DONE ?
A917 F0 05	BEG	HSER10	; YES
A919 A2 02	LDX	##02	; DEC ENERGY
A91B 4C 6F B8	JMP	PANDS6	
A91E	HSER10		
		HWARP COMPLETE	
A91E A0 19	LDY	#SENHWC-SENTAB	
A920 20 B7 A9	JSR	HABOR2	
A923 A5 BF	LDA	HYHPOS	
A925 B5 BD	STA	GHPOS	
A927 A5 BE	LDA	HYVPOS	
A929 B5 BC	STA	GVPOS	
A92B 4A	LSR	A	
A92C 29 07	AND	##07	
A92E AA	TAX		
A92F BD B3 BF	LDA	JMASK, X	
A932 B5 C7	STA	JMPMSK	
A934 A4 92	LDY	HYPGAD	
A936 B4 90	STY	QUADRT	
A938 A9 00	LDA	##00	
A93A B5 7B	STA	BASFLG	
A93C BE C9 0B	LDX	CHTRAM, Y	
A93F 10 2E	BPL	HSERV2	
A941 A9 FF	LDA	##FF	; STARBASE STUFF
A943 B5 7B	STA	BASFLG	
A945 A0 00	LDY	##00	
A947	HSERV3		
A947 A9 00	LDA	##00	
A949 99 6B 0B	STA	XINCRE+2, Y	
A94C A9 01	LDA	##01	
A94E 99 AF 09	STA	XSIGN+2, Y	
A951 AD 0A D2	LDA	RANDOM	
A954 25 C7	AND	JMPMSK	


```

A956 99 42 0A STA XPOSH+2,Y
A959 98 TYA
A95A 18 CLC
A95B 69 31 ADC #RAMNUM
A95D A9 TAY
A95E C9 93 CMP #RAMNUM*3
A960 90 E5 BCC HSERV3
A962 AD 42 0A LDA XPOSH+2
A965 09 71 ORA #71
A967 8D 42 0A STA XPOSH+2
A96A A2 02 LDX #102
A96C 4C BE B7 JMP NEWST4
A96F HSERV2
A96F F0 0E BEQ HSERV1
A971 A9 FF LDA #FF ; RED ALERT
A973 85 B8 STA REDFLG
A975 A2 06 LDX #CH4IB2-CH4TAB
A977 20 A6 B3 JSR NOTINT
A97A A0 75 LDY #SENRED-SENTAB
A97C 20 23 B2 JSR LDMESS
A97F HSERV1
A97F 60 RTS

```

```

A980 HABORT
;
; HYPERWARP ABORT ROUTINE
A980 A2 01 LDX #01
A982 20 6F B8 JSR PAND86
A985 A0 17 LDY #SENHWA-SENTAB ; ABORT
A987 HABOR2 ; ENTRY POINT HWARP COMPLETE *****
A987 A9 00 LDA #00
A989 B5 71 STA WARP
A98B B5 C0 STA HFLAG
A98D HABOR1 ; ENTRY POINT BEGIN JUMP *****
A98D A9 10 LDA #STLAST
A98F B5 79 STA NSTARS
A991 A9 00 LDA #00
A993 B5 C1 STA HISPED
A995 B5 73 STA ETIMER ; KEEP PROGRAM FROM GOING SOUTH
A997 B5 BA STA HITME ; CLEAR THE OTHER EXPLOS BUG
A999 BD 8F 0C STA GINDEX+3
A99C B5 80 STA WPENER
A99E C0 17 CPY #SENHWA-SENTAB
A9A0 F0 04 BEQ HABOR3
A9A2 B5 E9 STA STFLAG+0
A9A4 B5 EA STA STFLAG+1
A9A6 HABOR3
A9A6 B5 EB STA STFLAG+2
A9AB B5 EC STA STFLAG+3
A9AA B5 ED STA STFLAG+4
A9AC B5 75 STA BSEQTM
A9AE BD 5C 09 STA DCSTOR
A9B1 4C 23 B2 JMP LDMESS

```

A9B4 HLINEB


```

      A421      DIVIDE      A = (TOP/BOTTOM)X80
      AA21 A9 00      LDA      #00      ; CLEAR THE RESULT
      AA23 B5 6D      STA      TEMP3
      AA25 A9 07      LDA      #07      ; NUMBER OF SHIFTS
      AA27 B5 6E      STA      TEMP4
      ;
      ; SHIFT 0 INTO THE MSBIT
      AA29 46 6B      LSR      TEMP1      ; TOP NUMBER
      AA2B 66 6A      ROR      TEMP
      AA2D A5 D0      LDA      DISFLG
      AA2F D0 0F      BNE      DIVID1      ; FRONT OR BACK ?
      ; BACK
      AA31 BD 40 0A      LDA      XPOSH, X      ; BOTTOM NUMBER
      AA34 4A      LSR      A
      AA35 B5 69      STA      PNTR+1
      AA37 BD D3 0A      LDA      XPSL, X
      AA3A 6A      ROR      A
      AA3B B5 6B      STA      PNTR
      AA3D 4C 52 AA      JMP      DIVID2
      AA40      DIVID1
      AA40 3B      SEC
      AA41 A9 00      LDA      #00
      AA43 FD D3 0A      SBC      XPSL, X
      AA46 B5 6B      STA      PNTR
      AA48 A9 00      LDA      #00
      AA4A FD 40 0A      SBC      XPOSH, X
      AA4D 4A      LSR      A
      AA4E B5 69      STA      PNTR+1
      AA50 66 6B      ROR      PNTR
      ;
      AA52      DIVID2
      AA52 06 6D      ASL      TEMP3      ; SHIFT RESULT
      AA54 3B      SEC      ; SUBTRACT BOTTOM FROM TOP
      AA55 A5 6A      LDA      TEMP
      AA57 E5 6B      SBC      PNTR
      AA59 A8      TAY
      AA5A A5 6B      LDA      TEMP1
      AA5C E5 69      SBC      PNTR+1
      AA5E 90 06      BCC      DIVID3      ; BOTTOM GREATER THAN TOP
      ; TOP LARGER
      AA60 B5 6B      STA      TEMP1      ; STORE REMAINDER
      AA62 B4 6A      STY      TEMP
      AA64 E6 6D      INC      TEMP3      ; ADD 1 TO RESULT
      AA66      DIVID3
      AA66 06 6A      ASL      TEMP      ; SHIFT TOP
      AA68 26 6B      ROL      TEMP1
      AA6A 90 03      BCC      DIVID4
      ; IF TOP IS GREATER THN BOTTOM THEN OVERFLOW
      AA6C A9 FF      LDA      #FF      ; MAX VALUE TO RESULT
      AA6E 60      RTS
      AA6F      DIVID4
      AA6F C6 6E      DEC      TEMP4      ; NEXT BIT
      AA71 10 DF      BPL      DIVID2
      AA73 A4 6D      LDY      TEMP3      ; RESULT IN Y
      AA75 B9 E9 0D      LDA      PTAB, Y      ; MULTIPLY BY 80 (PTAB)
      AA7B      DIVID5
      AA7B 60      RTS      ; ENTRY POINT FROM THINK *****
  
```

AA79	THINK		COMPUTER ATTACK SUBROUTINE
AA79 A5 C0		LDA	HFLAG
AA7B 05 7B		ORA	BASFLG
AA7D D0 F9		BNE	DIVID5 ; BRANCH TO RTS
			CRUISER PHOTON CONVERGENCE
AA7F A5 B6		LDA	LOKL0C
AA81 F0 30		BEQ	THIN38
AA83 A6 B9		LDX	LOKTAR
AA85 38		SEC	
AA86 BD F9 0B		LDA	VPOS, X
AA89 ED FC 0B		SBC	VPOS+3
AA8C 90 02		BCC	THIN37
AA8E A9 00		LDA	##00
AA90	THIN37		
AA90 20 CA AE		JSR	POHELP
AA93 BD CB 0B		STA	ZINCRE+3
AA96 BD CC 0B		STA	ZINCRE+4
AA99 38		SEC	
AA9A AD 2D 0C		LDA	HPOS+3
AA9D FD 2A 0C		SBC	HPOS, X
AAA0 20 CA AE		JSR	POHELP
AAA3 BD 9A 0B		STA	YINCRE+3
AAA6 38		SEC	
AAA7 AD 2E 0C		LDA	HPOS+4
AAA9 FD 2A 0C		SBC	HPOS, X
AAAD 20 CA AE		JSR	POHELP
AAB0 BD 9B 0B		STA	YINCRE+4
AAB3	THIN38		
			HELPER FOR THINK
AAB3 A2 03		LDX	##03
AAB5	THIN39		
AAB5 D6 BA		DEC	ROTTIM, X
AAB7 10 27		BPL	THIN44
AAB9 8A		TXA	
AABA 4A		LSR	A
AABB AB		TAY	
AABC B9 CB 00		LDA	HORJOY, Y
AABF A4 D0		LDY	DISFLG
AAC1 F0 05		BEQ	THIN40
AAC3 49 FF		EOR	##FF
AAC5 18		CLC	
AAC6 69 01		ADC	##01
AAC8	THIN40		
AAC8 18		CLC	
AAC9 75 B4		ADC	XINPRS+2, X
AACB 10 02		BPL	THIN41
AACD A9 00		LDA	##00
AACF	THIN41		
AACF C9 10		CMP	##10
AAD1 90 02		BCC	THIN42
AAD3 A9 0F		LDA	##0F
AAD5	THIN42		
AAD5 75 B4		STA	XINPRS+2, X
AAD7 C9 0B		CMP	##0B

AAD9 90 02	BCC	THIN43	
AADB 49 0F	EOR	##0F	
AADE		THIN43	
AADD 0A	ASL	A	
AADC 95 BA	STA	ROTTIM, X	
AAEO		THIN44	
AAEO CA	DEX		
AAE1 10 D2	BPL	THIN39	
AAE3 AD 8E 0C	LDA	GINDEX+2	
AAE6 DQ 1B	BNE	THINK2	; NOT A PHOTON
		PHOTON CONVERGENCE	
AAE8 A4 62	LDY	MISDIF	; DIFFICULTY
AAEA B9 85 BF	LDA	PHODIF, Y	
AAED AE A4 0A	LDX	ZPOSH+2	
AAFO 10 02	BPL	THINK3	
AAF2 29 7F	AND	##7F	
AAF4		THINK3	
AAF4 BD CA 0B	STA	ZINCRE+2	
AAF7 09 80	ORA	##80	
AAF9 AE 73 0A	LDX	YPOSH+2	
AAFC 10 02	BPL	THINK4	
AAFE 29 7F	AND	##7F	
AB00		THINK4	
AB00 BD 99 0B	STA	YINCRE+2	
AB03		THINK2	
AB03 A5 76	LDA	BINTIM	
AB05 29 03	AND	##03	
AB07 FO 2E	BEG	THINK5	
AB09		THINK1	
AB09 A5 E6	LDA	GRAPH+2	
AB0B FO 04	BEG	THIN20	; NOT ON
AB0D A5 EB	LDA	STFLAG+2	
AB0F D0 25	BNE	THIN14	
AB11		THIN20	
			METEORITE
AB11 AD 0A D2	LDA	RANDOM	
AB14 C9 04	CMP	##04	
AB16 B0 1E	BCS	THIN14	
AB18 A9 60	LDA	##60	
AB1A 8D BE 0C	STA	GINDEX+2	
AB1D A2 02	LDX	##02	
AB1F 20 64 B7	JSR	NEWSTR	; DEFINE LIKE A STAR
AB22 A9 3C	LDA	##60	
AB24 85 EB	STA	STFLAG+2	
AB26 A9 8B	LDA	##8B	
AB28 8D 68 0B	STA	XINCRE+2	
AB2B A9 00	LDA	##00	
AB2D 8D 2C 0C	STA	HPDS+2	; METEROR FLASH
AB30 8D 99 0B	STA	YINCRE+2	
AB33 8D CA 0B	STA	ZINCRE+2	
AB36		THIN14	
AB36 60	RTS		
AB37		THINK5	
AB37 A5 A7	LDA	ZYTOGG	
AB39 49 01	EOR	##01	
AB3B 85 A7	STA	ZYTOGG	
AB3D AA	TAX		; WHICH ZYLON TO THINK
AB3E B5 E9	LDA	STFLAG, X	; ALREADY ON?
AB40 D0 42	BNE	THINK6	; YES

AB42 A5 E9	LDA	INIT ZYLOH
AB44 05 EA	ORA	STFLAG+0
AB46 29 01	AND	STFLAG+1
AB48 A4 90	LDY	#*01
AB4A D9 C9 08	CMP	QUADRT
AB4D B0 BA	BCS	CHTRAM, Y
		THINK1
		OK TO INIT
AB4F A9 FF	LDA	##FF
AB51 95 E9	STA	STFLAG, X
AB53 AD 0A D2	LDA	RANDOM
AB56 29 07	AND	##07
AB58 A8	TAY	
AB59 B9 89 BF	LDA	ZYGIND, Y
AB5C 9D 8C 0C	STA	GINDEX+0, X
AB5F A5 62	LDA	MISDIF
AB61 F0 03	BEQ	THIN45
AB63 B9 91 BF	LDA	INTSEQ, Y
AB66		THIN45
AB66 95 A8	STA	SEQEN, X
AB68 A9 01	LDA	##01
AB6A 95 AA	STA	SEQTIM, X
AB6C 9D AD 09	STA	XSIGN, X
AB6F AD 0A D2	LDA	RANDOM
AB72 25 C7	AND	JMPMSK
AB74 9D A2 0A	STA	ZPOSH, X
AB77 69 13	ADC	##13
AB79 9D 71 0A	STA	YPOSH, X
AB7C 09 71	ORA	##71
AB7E 9D 40 0A	STA	XPOSH, X
AB81 20 BE B7	JSR	NEWST4
AB84		THINK6
		Y, Z RANDOM SIGN

SEQUENCER AND TIMEOUT SECTION

AB84 BD 40 0A	LDA	XPOSH, X
AB87 C9 20	CMP	##20
AB89 B0 11	BCS	THIN27
AB8B BD AD 09	LDA	XSIGN, X
AB8E F0 08	BEQ	THIN26
AB90 B5 E4	LDA	GRAPH, X
AB92 F0 08	BEQ	THIN27
AB94 C9 29	CMP	#ZYGRF6-ZYGRAF
AB96 F0 04	BEQ	THIN27
AB98		THIN26
AB98 A9 00	LDA	##00
AB9A 95 AB	STA	SEQEN, X
AB9C		THIN27
AB9C D6 AA	DEC	SEQTIM, X
AB9E 10 24	BPL	THIN30
ABAA 09 78	LDA	#120
ABA2 95 AA	STA	SEQTIM, X
ABA4 A5 62	LDA	MISDIF
ABA6 AC 0A D2	LDY	RANDOM
ABA9 C0 30	CPY	##30
ABAB 90 01	BCC	THIN35
ABAD 4A	LSR	A
ABAE		THIN35
ABAE 4A	LSR	A
ABAF 95 BB	STA	BSTRAF, X

TIMEOUT

ABB1 B5 AB		LDA	SEGEN, X	
ABB3	THIN28			
ABB3 2C 0A D2		BIT	RANDOM	
ABB6 10 02		BPL	THIN31	
ABB8 49 0F		EOR	#0F	
ABBA	THIN31			
ABBA 95 AC		STA	XINDEX, X	
ABBC E8		INX		
ABBD E8		INX		
ABBE E0 06		CPX	#06	
ABCO 90 F1		BCC	THIN28	
ABC2 A6 A7		LDX	ZYTOGG	RESTORE X
ABC4	THIN30			

ZYLN STRAFING SECTION

ABC4 B5 AB		LDA	SEGEN, X	
ABC6 D0 32		BNE	THIN24	
ABC8 A4 A7		LDY	ZYTOGG	
ABCA	THIN11			
ABCA C0 31		CPY	#RAMNUM	
ABCC B0 13		BCS	THIN12	
ABCE B9 B8 00		LDA	BSTRAF, Y	
ABD1 4A		LSR	A	
ABD2 B9 40 0A		LDA	XPOSH, Y	
ABD5 B0 06		BCS	THIN36	
ABD7 C9 0A		CMP	#0A	
ABD9 90 0E		BCC	THIN22	
ABDB B0 04		BCS	THIN12	JUMP
ABDD	THIN36			
ABDD C9 F5		CMP	#F5	
ABDF B0 04		BCS	THIN33	
ABE1	THIN12			
ABE1 B9 AD 09		LDA	XSIGN, Y	
ABE4 4A		LSR	A	
ABE5	THIN33			
ABE5 A9 0F		LDA	#0F	
ABE7 B0 02		BCS	THIN23	
ABE9	THIN22			
ABE9 A9 00		LDA	#00	
ABEB	THIN23			
ABEB 95 AC		STA	XINDEX, X	
ABED 18		CLC		
ABEE 98		TYA		
ABEF 69 31		ADC	#RAMNUM	
ABF1 A8		TAY		
ABF2 E8		INX		
ABF3 E8		INX		
ABF4 E0 06		CPX	#06	
ABF6 90 D2		BCC	THIN11	
ABFB A6 A7		LDX	ZYTOGG	RESTORE X
ABFA	THIN24			

ACCELERATION SECTION

ABFA A4 A7		LDY	ZYTOGG	
ABFC	THINK8			
ABFC B5 B2		LDA	XINPRS, X	
ABFE D5 AC		CMP	XINDEX, X	
AC00 F0 08		BEG	THIN10	

AC02 B0 04	BCS	THINK9	
AC04 F6 B2	INC	XINPRS, X	
AC06 90 02	BCC	THIN10	; JUMP
AC08		THINK9	
AC08 06 B2	DEC	XINPRS, X	
AC0A		THIN10	
AC0A 86 6A	STX	TEMP	; SAVE X
AC0C AA	TAX		
AC0D 8D 99 BF	LDA	ZYWARP, X	
AC10 A6 6A	LDX	TEMP	; RESTORE X
AC12 99 66 0B	STA	XINCRE, Y	
AC15 98	TVA		
AC16 1B	CLC		
AC17 69 31	ADC	#RAMNUM	
AC19 AB	TAY		
AC1A EB	INX		
AC1B EB	INX		
AC1C E0 06	CPX	##06	
AC1E 90 DC	BCC	THINK9	
AC20 A6 A7	LDX	ZYTOGG	; RESTORE X

FIRE PHOTON

AC22 AD BE 0C	LDA	GINDEX+2	
AC25 D0 0B	BNE	THIN16	
AC27 A5 EB	LDA	STFLAG+2	
AC29 D0 06	BNE	THIN13	
AC2B A5 BE	LDA	PHEXWT	
AC2D F0 03	BEQ	THIN16	
AC2F C6 BE	DEC	PHEXWT	
AC31		THIN13	
AC31 60	RTS		
AC32		THIN16	
AC32 1B	CLC		
AC33 BD A2 0A	LDA	ZPOSH, X	
AC36 69 02	ADC	##02	
AC38 C9 05	CMF	##05	
AC3A B0 F5	BCS	THIN13	
AC3C A0 D0	LDY	##D0	
AC3E BD AD 09	LDA	XSIGN, X	
AC41 4A	LSR	A	
AC42 BD 40 0A	LDA	XPOSH, X	
AC45 B0 0B	BCS	THIN15	
AC47 49 FF	EDR	##FF	
AC49 A4 62	LDY	MISDIF	
AC4B F0 E4	BEQ	THIN13	
AC4D A0 50	LDY	##50	
AC4F		THIN15	
AC4F C9 20	CMF	##20	
AC51 B0 DE	BCS	THIN13	
AC53 BC 68 0B	STY	XINCRE+2	
AC56 A9 00	LDA	##00	
AC58 BD 8E 0C	STA	GINDEX+2	
AC5B BD 2C 0C	STA	HPQS+2	; METEROR FLASH
AC5E A9 3E	LDA	#62	
AC60 B5 EB	STA	STFLAG+2	
AC62 A2 02	LDX	##02	
AC64 A4 A7	LDY	ZYTOGG	
AC66 B4 BF	STY	ATTARG	
AC68 4C AF AC	JMP	EXHELP	

AC6B

EXPLOS

INIT EXPLOSION

Y CONTAINS INDEX OF ZYLON HIT
; 2 SECONDS

AC6B A9 80

LDA

#\$80

AC6D 85 73

STA

ETIMER

AC6F A2 30

LDX

#RMLAST

AC71 86 79

STX

NSTARS ; LAST STAR FOR EXPLOSION

AC73

EXPLS1

AC73 AD 0A D2

LDA

RANDOM

AC76 29 0F

AND

#\$0F

AC78 79 2A 0C

ADC

HPOS, Y

AC7B E9 30

SBC

#\$30

AC7D 9D 2A 0C

STA

HPOS, X

AC80 AD 0A D2

LDA

RANDOM

AC83 29 0F

AND

#\$0F

AC85 79 F9 0B

ADC

VPOS, Y

AC8B 4A

LSR

A

AC89 E9 10

SBC

#\$10

AC8B 9D F9 0B

STA

VPOS, X

AC8E 20 AF AC

JSR

EXHELP

AC91 AD 0A D2

LDA

RANDOM

AC94 29 87

AND

#\$87

AC96 9D 66 0B

STA

XINCRE, X

AC99 AD 0A D2

LDA

RANDOM

AC9C 29 87

AND

#\$87

AC9E 9D 97 0B

STA

YINCRE, X

ACA1 AD 0A D2

LDA

RANDOM

ACA4 29 87

AND

#\$87

ACA6 9D C8 0B

STA

ZINCRE, X

ACA9 CA

DEX

ACAA E0 10

CPX

#STLAST

ACAC D0 C5

BNE

EXPLS1

ACAE 60

RTS

ACAF

EXHELP

EXPLOSION HELPER

ACAF B9 AD 09

LDA

XSIGN, Y

ACB2 9D AD 09

STA

XSIGN, X

ACB5 B9 40 0A

LDA

XPOSH, Y

ACB8 9D 40 0A

STA

XPOSH, X

ACBB B9 D3 0A

LDA

XPOSL, Y

ACBE 9D D3 0A

STA

XPOSL, X

ACC1

EXHLP1

; ENTRY POINT FROM HLINES

ACC1 B9 DE 09

LDA

YSIGN, Y

ACC4 9D DE 09

STA

YSIGN, X

ACC7 B9 71 0A

LDA

YPOSH, Y

ACCA 9D 71 0A

STA

YPOSH, X

ACCD B9 0F 0A

LDA

ZSIGN, Y

ACD0 9D 0F 0A

STA

ZSIGN, X

ACD3 B9 A2 0A

LDA

ZPOSH, Y

ACD6 9D A2 0A

STA

ZPOSH, X

ACD9 B9 04 0B

LDA

YPOSL, Y

ACDC 9D 04 0B

STA

YPOSL, X

ACDF B9 35 0B

LDA

ZPOSL, Y

ACE2 9D 35 0B

STA

ZPOSL, X

ACE5 EXHLP2 ; ENTRY POINT FROM BSERVE *****
 ACE5 60 RTS

ACE6	BSERVE	STARBASE SERVICE ROUTINE
ACEA A5 7B	LDA	BASFLG
ACEB F0 FB	BEG	EXHLP2 ; BRANCH TO RTS
ACEA A5 D0	LDA	DISFLG
ACEC D0 05	BNE	BSERV9
ACEE A9 14	LDA	##14 ; PRIORITY FOR FRONT VIEW OF STARBASE
ACFO BD 1B D0	STA	PRIOR
ACF3	BSERV9	
ACF3 A9 02	LDA	##02
ACF5 BD 5C 09	STA	DCSTOR
ACFB A9 30	LDA	##30
ACFA BD 8E 0C	STA	GINDEX+2
ACFD A9 20	LDA	##20
ACFF BD 8D 0C	STA	GINDEX+1
AD02 A9 40	LDA	##40
AD04 BD 8C 0C	STA	GINDEX+0
AD07 A9 FF	LDA	##FF
AD09 A6 90	LDX	QUADRT
AD0B BC C9 0B	LDY	CHTRAM, X
AD0E 30 02	BMI	BSER13
AD10 A9 00	LDA	##00
AD12	BSER13	
AD12 85 E9	STA	STFLAG+0
AD14 85 EA	STA	STFLAG+1
AD16 85 EB	STA	STFLAG+2
AD18 85 7B	STA	BASFLG
AD1A 30 0A	BMI	BSERV1
AD1C A0 02	LDY	##02
AD1E 20 6B AC	JSR	EXPLOS
AD21 A2 0A	LDX	##NOITB1-NOISTB
AD23 4C AB AE	JMP	NOISE
AD26	BSERV1	
AD26 AD 42 0A	LDA	XPOSH+2
AD29 D0 0A	BNE	BSER14
AD2B AD D5 0A	LDA	XPOSL+2
AD2E C9 20	CMP	##20
AD30 B0 03	BCS	BSER14
AD32 EE D5 0A	INC	XPOSL+2
AD35	BSER14	
AD35 AD 2C 0C	LDA	ORBIT ?
AD38 38	SEC	HPOS+2
AD39 E9 7B	SBC	##7B
AD3B C9 10	CMP	##10
AD3D B0 22	BCS	BSERV8
AD3F AD FB 0B	LDA	VPOS+2
AD42 38	SEC	
AD43 E9 6B	SBC	##6B
AD45 C9 10	CMP	##10
AD47 B0 1B	BCS	BSERV8

AD49 AD 42 0A	LDA	XPOSH+2	
AD4C C9 02	CMP	#402	
AD4E 80 11	BCS	BSEVR8	
AD50 AD AF 09	LDA	XSIGN+2	
AD53 2D 11 0A	AND	ZSIGN+2	
AD56 49 01	EOR	#01	
AD58 05 70	ORA	SPEED	
AD5A 0D A4 0A	ORA	ZPOSH+2	
AD5D 05 71	ORA	WARP	
AD5F F0 10	BEG	BSEVR3	; IN ORBIT
AD61	BSEVR8		
AD61 A5 75	LDA	BSEGTM	; ORBIT ABORTED
AD63 C9 02	CMP	#02	
AD65 90 05	BCC	BSEVR15	
AD67 A0 1F	LDY	#SENDKA-SENTAB	
AD69 20 23 B2	JSR	LDMESS	
AD6C	BSEVR15		
AD6C A9 00	LDA	#00	
AD6E 85 75	STA	BSEGTM	
AD70	BSEVR11		
AD70 60	RTS		
AD71	BSEVR3		
AD71 24 75	BIT	BSEGTM	
AD73 70 0D	BVS	BSEVR4	
AD75 30 42	BMI	BSEVR5	
AD77 A5 75	LDA	BSEGTM	; LD MESS
AD79 D0 F5	BNE	BSEVR11	; NO
AD7B C6 75	DEC	BSEGTM	; =FF
AD7D A0 1C	LDY	#SENORB-SENTAB	
AD7F 4C 23 B2	JMP	LDMESS	
AD82	BSEVR4		
AD82 A2 00	LDX	#00	
AD84 86 65	STX	REPMSG	
AD86 A4 D1	LDY	SENPTR	
AD88 D0 E6	BNE	BSEVR11	; WAIT FO MESSAGE TO TIMEOUT
AD8A A9 50	LDA	#50	
AD8C 8D 90 0C	STA	GINDEX+4	
AD8F A9 01	LDA	#01	
AD91 8D B1 09	STA	XSIGN+4	
AD94 8D E2 09	STA	YSIGN+4	
AD97 8D 13 0A	STA	ZSIGN+4	
AD9A 8D A6 0A	STA	ZPOSH+4	
AD9D 8D 9B 0B	STA	YINCRE+4	
ADA0 A9 10	LDA	#10	
ADA2 8D 44 0A	STA	XPOSH+4	
ADA5 A9 00	LDA	#00	
ADA7 8D 75 0A	STA	YPOSH+4	
ADAA A9 B7	LDA	#B7	
ADAC 8D 6A 0B	STA	XINCRE+4	
ADAF A9 B1	LDA	#B1	
ADB1 85 75	STA	BSEGTM	
ADB3 8D CC 0B	STA	ZINCRE+4	
ADB6 85 ED	STA	STFLAG+4	
ADB8	BSEVR7		
ADB8 60	RTS		
ADB9	BSEVR5		
ADB9 AD B1 09	LDA	XSIGN+4	; SHIP DOCKED ?
ADBC D0 FA	BNE	BSEVR7	; NO
ADBE A2 0C	LDX	#CH4TB3-CH4TAB	; SOUND

```

ADC0 20 A6 B3      JSR    NOTINT
ADC3 A0 21          LDY    #SENETC-SENTAB
ADC5 20 23 B2      JSR    LDMESS
                        CLEAR  DAMAGE
ADC8 A2 05          LDX    #*05
ADCA                      BSER12
ADCA 8D 8B B3      LDA    STINIT+73, X
ADCD 9D 92 09      STA    DAMAGE, X
ADD0 CA            DEX
ADD1 10 F7          BPL    BSER12

```

```

ADD3 A9 B9          LDA    NEW ENERGY
ADD5 A2 03          LDX    #*89
                        #*03
ADD7                      BSER20
ADD7 9D 55 09      STA    DENERG+0, X
ADDA CA            DEX
ADDB 10 FA          BPL    BSER20
ADDD A9 07          LDA    #*07
ADDF 8D 6A 0B      STA    XINCRE+4
ADE2 A9 81          LDA    #*81
ADE4 8D 9B 0B      STA    YINCRE+4
ADE7 A9 01          LDA    #*01
ADE9 8D CC 0B      STA    ZINCRE+4
ADEC 85 75          STA    BSEQTM
ADEE 4C 7B B0      JMP    KEYSR7      ; RE-LOAD INSET

```

```

ADF1          LDISP
                        ;
                        ; LOAD DISPLAY LISTS
                        ; A=#OF BYTES TO STORE, X=POSIT IN DISPLY, Y=PNTR IN LISTAB
                        ; WE DONT WANT NO INTERRUPTS !!
ADF1 7B          SEI
ADF2 85 6A      STA    TEMP
ADF4          LDISP3
ADF4 AD 0B D4   LDA    VCOUNT      ; CHECK IF ANTIC IS IN SAFE AREA
ADF7 C9 7C      CMP    #DISTOP
ADF9 90 F9      BCC    LDISP3
ADFB          LDISP2
ADFB B9 62 BA   LDA    LISTAB, Y
ADFE CB        INY
ADFF 10 02      BPL    LDISP1
AE01 A9 0D      LDA    #*0D
AE03          LDISP1
AE03 9D 80 02   STA    DISPLY, X
AE06 EB        INX
AE07 C6 6A      DEC    TEMP
AE09 D0 F0      BNE    LDISP2
AE0B 5B        CLI
AE0C 60        RTS

```

```

AE0D          CLRMAP

```

```

      AE0D A9 10      LDA      CLEAR MEMORY MAP SUBROUTINE
      AE0F          CLRMP1    #MEMMAP/256
      AE0F B5 69      STA      ; ENTRY POINT CLEAR ALL RAM *****
      AE11 A9 00      LDA      #*00
      AE13 A8          TAY
      AE14 B5 68      STA      PNTR
      AE16 B5 A3      STA      LOKFLG      ; LOCK FLAG IS CLEARED
      AE18 B5 7A      STA      CNSTAR      ; RAM HAS BEEN CLEARED
      AE1A          CLRMP2
      AE1A 71 68      STA      (PNTR),Y
      AE1C CB          INY
      AE1D D0 FB      BNE      CLRMP2
      AE1F E6 69      INC      PNTR+1
      AE21 A4 69      LDY      PNTR+1
      AE23 C0 20      CPY      #*20
      AE25 A8          TAY      ; RE-ZERO Y REG
      AE26 90 F2      BCC      CLRMP2
      AE28 60          RTS

```

```

      AE29          PHOTON

```

PHOTON TORPEDO FIRE

```

      AE29 A5 B4      LDA      PHOFLG      ; REPEAT FLAG
      AE2B AC 10 D0   LDY      TRI00      ; SHOOT ?
      AE2E B4 B4      STY      PHOFLG
      AE30 D0 0E      BNE      PHOTN2      ; NO
      AE32 B4 66      STY      TIMOUT      ; RESET ATRACT TIMEOUT
      AE34 A6 C0      LDX      HFLAG      ; HWARP ?
      AE36 D0 08      BNE      PHOTN2      ; YES, NO FIRE
      AE38 A6 B7      LDX      PHOT00
      AE3A C9 01      CMP      #*01
      AE3C F0 03      BEQ      PHOTN8
      AE3E B0 18      BCS      PHOTN4

```

```

      AE40          PHOTN2

```

```

      AE40 60          RTS
      AE41          PHOTN8

```

ONE-SHOT

```

      AE41 B5 EC      LDA      STFLAG+3,X      ; ONE-SHOT TIMEOUT
      AE43 C9 E8      CMP      #*E8
      AE45 B0 F9      BCS      PHOTN2      ; ALL DONE ?
      AE47 AC 5C 09   LDY      DCSTOR      ; NO
      AE4A B4 B9      STY      LOKTAR
      AE4C A9 0C      LDA      #12
      AE4E A4 A3      LDY      LOKFLG
      AE50 B4 B6      STY      LOKLOC
      AE52 F0 02      BEQ      PHOTN3
      AE54 A9 00      LDA      #*00

```

```

      AE56          PHOTN3

```

```

      AE56 B5 B8      STA      LOKWAT

```

```

      AE58          PHOTN4
      AE58 B4 B4      STY      PHOFLG

```

```

      AE5A 2C 92 09   BIT      DAMAGE+0

```

```

      AE5D 70 E1      BVS      PHOTN2

```

```

      AE5F 30 05      BMI      PHOTN7

```

```

      AE61 B4          TXA

```

```

      AE62 49 01      EOR      #*01

```

```

      AE64 B5 B7      STA      PHOT00

```

```

      AE66          PHOTN7

```

AE66 BA	TXA	
AE67 9D E1 09	STA	YSIGN+3, X ; NEW YSIGN
AE6A BD 73 BF	LDA	PHOYPS, X ; NEW YPOSH
AE6D 9D 74 0A	STA	YPOSH+3, X
AE70 A9 FF	LDA	##FF
AE72 95 EC	STA	STFLAG+3, X ; INIT PHOTON TIME
AE74 9D A5 0A	STA	ZPOSH+3, X
AE77 A9 00	LDA	##00
AE79 9D BF 0C	STA	GINDEX+3, X ; INIT PHOTON GRAPHIC
AE7C 9D 43 0A	STA	XPOSH+3, X
AE7F 9D 07 0B	STA	YPSL+3, X
AE82 9D 12 0A	STA	ZSIGN+3, X
AE85 9D 3B 0B	STA	ZPSL+3, X
AE88 A9 01	LDA	##01
AE8A 9D B0 09	STA	XSIGN+3, X
AE8D 9D D6 0A	STA	XPSL+3, X
AE90 A5 D0	LDA	DISFLG
AE92 4A	LSR	A
AE93 6A	ROR	A
AE94 09 66	ORA	##66
AE96 9D 69 0B	STA	XINCRE+3, X
AE99 A9 00	LDA	##00
AE9B 9D 9A 0B	STA	YINCRE+3, X
AE9E 9D CB 0B	STA	ZINCRE+3, X
AEA1 A2 02	LDX	##02
AEA3 20 6F BB	JSR	PANDS6 ; PHOTON ENERGY
AEA5 A2 00	LDX	##00

FALL THROUGH TO NOISE *****

AEAB	NOISE	
		NOISE INIT, X=NOISTB PNTR
AEAB BA	TXA	; PHOTONS
AEA9 D0 06	BNE	NOISE1 ; NO
		PHOTONS HAVE LOWER PRIORITY THAN EXPLOSIONS
AEAB A5 E1	LDA	AUDTIM
AEAD C9 1B	CMP	##1B
AEAF B0 1B	BCS	NOISE2
AEB1	NOISE1	
AEB1 A0 07	LDY	##07
AEB3	NOISE3	
AEB3 BD 20 BF	LDA	NOISTB, X
AEB6 99 DA 00	STA	PHOREP, Y
AEB9 EB	INX	
AEBA BB	DEY	
AEBB 10 F6	BPL	NOISE3
AEBD BD 20 BF	LDA	NOISTB, X
AECO BD 0B D2	STA	AUDCTL
AEC3 BD 21 BF	LDA	NOISTB+1, X
AEC6 BD 04 D2	STA	AUDF3
AEC9	NOISE2	
AEC9 60	RTS	

AECA	POHELP	
		PHOTON HELPER
AECA A0 B0	LDY	##B0
AECC B0 04	BCS	POHLP1
AECE 49 FF	EOR	##FF

Address	Instruction	Operation	Comments
AE01	DAMCTL		
AE01	24 64	BIT	DAMAGE CONTROL ROUTINE
AE03	30 57	BMI	ATRAC7
AE05	A6 62	LDX	DAMCT1 ; GAME OVER NO DAMAGE
AE07			
AE07	AD 0A D2	LDA	DAMCT2 RANDOM
AE0A	DD 10 BF	CMP	DRBRTB, X
AE0D	B0 4D	BCS	DAMCT1
AE0F	29 07	AND	##07
AE11	C9 06	CMP	##06
AE13	B0 47	BCS	DAMCT1
AE15	AA	TAX	
AE16	BD 92 09	LDA	DAMAGE, X
AE19	0A	ASL	A
AE1A	30 EB	BMI	DAMCT2
AE1C	A5 EB	LDA	STFLAG+2
AE1E	C9 1E	CMP	#30
AE20	A9 80	LDA	##80
AE22	BC 14 BF	LDY	DAMGTB, X
AE25	90 17	BCC	DAMCT3
AE27	E0 03	CPX	##03
AE29	D0 05	BNE	DAMCT5
AE2B	2C 96 09	BIT	DAMAGE+4
AE2E	70 0E	BVS	DAMCT3
AE30			
AE30	E0 04	CPX	DAMCT5 ##04
AE32	D0 05	BNE	DAMCT6
AE34	2C 95 09	BIT	DAMAGE+3
AE37	70 05	BVS	DAMCT3
AE39			
AE39	A9 C0	LDA	DAMCT6 ##C0
AE3B	BC 1A BF	LDY	DESTTB, X
AE3E			
AE3E	1D 92 09	DAMCT3 ORA	DAMAGE, X
AE41	9D 92 09	STA	DAMAGE, X
AE44	64 65	STY	REPMSG
AE46	2C 95 09	BIT	DAMAGE+3
AE49	50 07	BVC	DAMCT4
AE4B	A9 00	LDA	##00
AE4D	85 7E	STA	ATENER
AE4F	20 0D AE	JSR	CLMAP
AE52			
AE52	A0 52	DAMCT4 LDY	#SENDMC-SENTAB
AE54	20 23 B2	JSR	LDMESS
AE57	A2 12	LDX	#CH4TB4-CH4TAB ; DAMAGE

AF39 20 A6 B3 JSR NOTINT
 AF3C DAMCT1
 AF3C 60 RTS

AF3D HITZYL

AF3D A2 02 LDX PHOTON HIT ZYLON CHECK
 AF3F HITZY2 #02 ; 2 PLAY PHOTONS

AF3F CA DEX

AF40 10 01 BPL HITZY1

AF42 60 RTS

AF43 BD BF 0C HITZY1 LDA QINDEX+3, X ; PHOTON ?

AF46 D0 F7 BNE HITZY2 ; NO

AF48 B5 EC LDA STFLAG+3, X ; PHOTON ON ?

AF4A F0 F3 BEQ HITZY2 ; NO

AF4C B5 B2 LDA PHITS+0, X ; ANY HIT ?

AF4E 29 07 AND #07 ; LOOK AT 0,1 ONLY

AF50 F0 ED BEQ HITZY2 ; NO HIT

AF52 4A LSR A ; 0 OR 1 ONLY

AF53 C9 03 CMP #03

AF55 D0 01 BNE HITZY9

AF57 4A LSR A

AF58 HITZY9

AF58 AB TAY ; OBJECT INDEX IN Y

AF59 B9 E9 00 LDA STFLAG, Y ; SHIP ON ?

AF5C F0 E1 BEQ HITZY2 ; NO

AF5E A5 D0 LDA DISFLG

AF60 F0 02 BEQ HITZYB

AF62 A9 FF LDA #\$FF

AF64 HITZYB

AF64 B5 6C STA TEMP2

AF66 59 40 0A EOR XPOSH, Y

AF69 C9 10 CMP #10

AF6B 90 02 BCC HITZY3

AF6D A9 0F LDA #0F

AF6F HITZY3

AF6F 4A LSR A

AF70 B4 6B STY TEMP1

AF72 A8 TAY

AF73 A5 6C LDA TEMP2

AF75 5D 43 0A EOR XPOSH+3, X

AF78 D9 75 BF CMP PHPOST, Y ; TOP BOUND

AF7B B0 C2 BCS HITZY2

AF7D D9 7D BF CMP PHPOSB, Y ; BOTTOM BOUND

AF80 90 BD BCC HITZY2

AF82 A4 6B LDY TEMP1

A HIT !!!

AF84 38 SEC

AF85 A9 FF LDA #\$FF

AF87 F5 EC SBC STFLAG+3, X

AF89 B5 E2 STA EXPDEL ; AUDIO

AF8B C9 0F CMP #15

AF8D 90 05 BCC HITZ11

AF8F B9 BC 0C LDA QINDEX, Y

AF92 C9 80 CMP #80

AF94 HITZ11

AF94 A9 00 LDA #00

AF96 B5 88 STA LOKWAT

AF98 95 EC STA STFLAG+3, X ; PHOTON OFF

AF9A B0 4B	BCS	HITZ10	
AF9C 99 E9 00	STA	STFLAG, Y	; ZYOLON OFF
AF9F B9 8C 0C	LDA	GINDEX, Y	
AFA2 F0 43	BEG	HITZ10	; PHOTON
AFA4 C9 60	CMP	#160	; METORER
AFA6 F0 3F	BEG	HITZ10	; YES
AFA8 A9 00	LDA	#00	
AFAA B5 B6	STA	LOKLOC	; TURN OFF PHOTONS TRACKING
AFAC A6 90	LDX	QUADRT	; WHICH QUAD KILL IN
AFAE DE C9 0B	DEC	CHTRAM, X	; REMOVE FROM CHART
AFB1 10 13	BPL	HITZY4	
AFB3 A9 00	LDA	#00	; JUST BLASTED A STARBASE ELSE IMPOSSIBLE TO GET HERE

AFB5 9D C9 0B	STA	CHTRAM, X
AFB8 3B	SEC	
AFB9 A5 CB	LDA	RATING
AFBB E9 03	SBC	#3
AFBD B5 CB	STA	RATING
AFBF A5 CC	LDA	RATING+1
AFC1 E9 00	SBC	#00
AFC3 B5 CC	STA	RATING+1
AFC5 60	RTS	
AFC6	HITZY4	

INCKIL
INCRE KILL COUNT DISPLAY

AFC6 1B	CLC	
AFC7 A5 CB	LDA	RATING
AFC9 69 06	ADC	#06
AFCB B5 CB	STA	RATING
AFCD A5 CC	LDA	RATING+1
AFCF 69 00	ADC	#00
AFD1 B5 CC	STA	RATING+1
AFD3 A2 01	LDX	#01
AFD5	INCKL1	
AFD5 FE 50 09	INC	DKILL, X ; KILL BYTE INCRE
AFD8 BD 50 09	LDA	DKILL, X
AFDB C9 4A	CMP	#4A ; BCD OVERFLOW
AFDD 90 0B	BCC	INCKL2 ; NO.
AFDF A9 40	LDA	#40 ; BCD 0
AFE1 9D 50 09	STA	DKILL, X
AFE4 CA	DEX	
AFE5 10 EE	BPL	INCKL1 ; NEXT BYTE
AFE7	INCKL2	

AFE7	HITZ10	
AFE7 20 6B AC	JSR	EXPLOS
AFEA A2 7F	LDX	#127
AFEC	HITZY5	
AFEC BD C9 0B	LDA	CHTRAM, X
AFEF 30 02	BMI	HITZY6
AFF1 D0 0A	BNE	HITZY7
AFF3	HITZY6	
AFF3 CA	DEX	
AFF4 10 F6	BPL	HITZY5
		WIN
AFF6 A0 3F	LDY	#SENWIN-SENTAB
AFF8 A2 00	LDX	#00
AFFA 20 21 B1	JSR	CRATE1
AFFD	HITZY7	

AFFD 60

RTS

AFFE

KEYSRV

KEYBOARD SERVICE ROUTINE

```

AFFE A5 CA      LDA      THEKEY      ; ANY KEY
B000 F0 3E      BEQ      KEYSR3      ; NO
B002 A2 14      LDX      ##14        ; LAST KEY
B004 B5 6A      STA      TEMP
B006 A9 00      LDA      ##00
B008 B5 66      STA      TIMEOUT      ; RESET ATRACT TIMEOUT
B00A B5 CA      STA      THEKEY      ; TURN OFF KEY
B00C A9 11      LDA      ##11
B00E BD 1B D0    STA      PRIOR      ; RESET PRIORITY, FROM STARBASE

```

KEYSR1

```

B011 BD BE BA    LDA      CODCON,X      ; KEY CODES
B014 C5 6A      CMP      TEMP
B016 F0 0B      BEQ      KEYSR2
B018 CA        DEX
B019 10 F6      BPL      KEYSR1      ; NEXT KEY

```

NO KEY

```

B01B A0 10      LDY      #SENWHT-SENTAB ; WHAT
B01D 4C 23 B2    JMP      LDMESS

```

KEYSR2

```

B020 E0 0A      CPX      ##0A        ; IMPULSE ENGINE ?
B022 B0 1D      BCS      KEYSR4      ; NO
B024 A5 C0      LDA      HFLAG      ; HWARP ?
B026 F0 03      BEQ      KEYS20      ; NO
B028 4C B0 A9    JMP      HABORT

```

KEYS20

```

B02B 2C 93 09    BIT      DAMAGE+1      ; ENGINES
B02E 50 06      BVC      KEYS23
B030 E0 06      CPX      ##06
B032 90 02      BCC      KEYS23
B034 A2 05      LDX      ##05

```

KEYS23

```

B036 BD D3 BA    LDA      WENTAB,X
B039 B5 B0      STA      WPENER      ; IMPULSE ENGINE ENERGY
B03B BD B4 BA    LDA      WARPTRB,X      ; SPEED
B03E B5 71      STA      WARP      ; SPEED DESIRED

```

KEYSR3

```

B040 60      RTS
B041          KEYSR4
B041 E0 0E      CPX      ##0E      ; DISPLAY TYPE KEY ?
B043 B0 1B      BCS      KEYSR5      ; NO

```

KEYS15

```

B045          ; ENTRY POINT TO INIT DISPLAY, *****
          ; X MUST BE DEFINED TO THE KEY CODE IN CODCON
B045 BD 1B BE    LDA      DISTYP-10,X
B048 B5 D0      STA      DISFLG
B04A BC B2 BA    LDY      DISDIS-10,X
B04D A2 02      LDX      #DISPL1-DISPLY
B04F A9 0B      LDA      ##0B
B051 20 F1 AD    JSR      LDISP

```

B054 A2 10

LDX #STLAST

B056

KEYSR6

B056 20 64 B7	JSR	NEWSTR	
B059 CA	DEX		
B05A E0 05	CPX	#0BJNUM	
B05C B0 FB	BCS	KEYSR6	
B05E 70 1B	BCC	KEYSR7	JUMP
B060	KEYSR5		
B060 E0 11	CPX	##11	TOGGLE TYPE ?
B062 B0 35	BCS	KEYSR8	NO
B064 BC 18 BE	LDY	TOFFMG-\$0E, X	
B067 B5 6E	LDA	TRKFLG-\$0E, X	
B069 5D 1B BE	EOR	TQGTAB-\$0E, X	
B06C 95 6E	STA	TRKFLG-\$0E, X	
B06E F0 03	BEG	KEYSR9	
B070 BC 1E BE	LDY	TONMSG-\$0E, X	
B073	KEYSR9		
B073 20 23 B2	JSR	LDMESS	
B076 A2 0C	LDX	#CH4TB3-CH4TAB	KEYS
B07B 20 A6 B3	JSR	NOTINT	
B07B	KEYSR7		ENTRY POINT FOR RE-LOADING INSET *****
B07B A2 16	LDX	##16	
B07D A4 7C	LDY	TRKFLG	
B07F F0 01	BEG	KEYS18	
B081 EB	INX		
B082	KEYS18		
B082 BE 5A 09	STX	DCSTQR-2	
B085 20 0D AE	JSR	CLRMAR	
B08B A5 7E	LDA	ATENER	
B08A F0 B4	BEG	KEYSR3	
B08C A6 D0	LDX	DISFLG	
B08E F0 06	BEG	KEYS10	
B090 E0 01	CPX	##01	
B092 D0 AC	BNE	KEYSR3	
B094 A2 2A	LDX	#INSTB1-INSTAB	
B096	KEYS10		
B096 4C 6F A7	JMP	LDINST	
B099	KEYSR8		
B099 E0 11	CPX	##11	HYPERWARP ?
B09B D0 50	BNE	KEYS13	
B09D A5 C0	LDA	HFLAG	HWARP ALREADY ON ?
B09F D0 5A	BNE	KEYS14	
BOA1 A9 7F	LDA	##7F	
BOA3 B5 C0	STA	HFLAG	
BOA5 A9 FF	LDA	##FF	
BOA7 B5 71	STA	WARP	
BOA9 A9 1E	LDA	#30	
BOAB B5 B0	STA	WPENER	
BOAD A9 30	LDA	#RMLAST	
BOAF B5 C3	STA	HPNTR	
		H STEERING STUFF	
BOB1 A9 00	LDA	##00	
BOB3 B5 C2	STA	HTIMER	
BOB5 BD 74 0A	STA	YPOSH+3	
BOB8 BD 07 0B	STA	YPOSL+3	
BOBB BD 3B 0B	STA	ZPOSL+3	
BOBE BD 69 0B	STA	XINCRE+3	
BOC1 A9 01	LDA	##01	
BOC3 BD B0 09	STA	XSIGN+3	
BOC6 BD E1 09	STA	YSIGN+3	
BOC9 BD 12 0A	STA	ZSIGN+3	
BOCC BD A5 0A	STA	ZPOSH+3	

B0CF A5 9F	LDA	HYHPOS	
B0D1 85 C4	STA	HSTEER	
B0D3 A5 8E	LDA	HYVPOS	
B0D5 85 C5	STA	VSTEER	
B0D7 A5 62	LDA	MISDIF	
B0D9 F0 08	BEG	KEYS24	
B0DB A5 91	LDA	HYPENG	
B0DD 2A	ROL	A	
B0DE 2A	ROL	A	
B0DF 2A	ROL	A	
B0E0 29 03	AND	##03	
B0E2 A8	TAY		
B0E3 B9 D7 BE	LDA	STERTB, Y	; DIFFICULTY
B0E6	KEYS24		
B0E6 85 C6	STA	STERMK	
		END STUFF	
B0EB A0 11	LDY	#SENHYP-SENTAB	; MESSAGE HYPER WARP ENGAGED
B0EA 4C 23 B2	JMP	LDMESS	
B0ED	KEYS13		
B0ED E0 13	CPX	##13	
B0EF B0 0B	BCS	KEYS27	; PAUSE
B0F1 AD 5C 09	LDA	DCSTOR	
B0F4 49 01	EOR	##01	
B0F6 29 01	AND	##01	
B0FB BD 5C 09	STA	DCSTOR	
B0FB	KEYS14		
B0FB 60	RTS		
B0FC	KEYS27		
B0FC D0 0B	BNE	KEYS28	
B0FE AD 00 D3	LDA	PORTA	; PAUSE UNTIL MOVE JOYSTICK
B101 C9 FF	CMP	##FF	
B103 F0 F7	BEG	KEYS27	
B105 60	RTS		
B106	KEYS28		
		MISSION ABORTED	
B106 A0 76	LDY	#SENABR-SENTAB	
B108 A2 04	LDX	##04	
		FALL THROUGH TO CRATE *****	
B10A	CRATE		
		CALCULATE RATING, X=0 MISSION COMPLETE, 4=ABORTED, 8=DESTROYED	
		Y=MESSAGE TYPE	
		GAME OVER, CALCULATE RATING	
B10A A9 00	LDA	##00	
B10C 85 EC	STA	STFLAG+3	; NO HWARP CURSOR
B10E 85 D6	STA	NPRIOR	
B110 85 D1	STA	SENPTR	
B112 85 8B	STA	REDFLQ	
B114 8D 07 D2	STA	AUDC4	
B117 85 71	STA	WARP	
B119 85 B1	STA	SPABAK	
B11B 85 7D	STA	SHENER	
B11D 85 C0	STA	HFLAG	
B11F 85 C1	STA	HISPED	
B121	CRATE1		
		; ENTRY POINT FOR A GOOD MISSION *****	
B121 A9 FF	LDA	##FF	
B123 85 64	STA	ATTRACT	
B125 84 65	STY	REPMSG	; REPEAT MESSAGE
B127 8A	TXA		

B128 05 62	ORA	MISDIF	MISSION DIFF GAME RESULT
B12A AA	TAX		
B12B 8D DD BE	LDA	DIFTAB, X	
B12E 1B	CLC		
B12F 65 CB	ADC	RATING	
B131 AA	TAX		
B132 A9 00	LDA	##00	
B134 85 C9	STA	VERJOY	
B136 85 CB	STA	HORJOY	
B138 65 CC	ADC	RATING+1	
B13A 30 25	BMI	CRATE3	
B13C 4A	LSR	A	
B13D 8A	TXA		
B13E 6A	ROR	A	
B13F 4A	LSR	A	
B140 4A	LSR	A	
B141 4A	LSR	A	
B142 C9 13	CMP	##13	
B144 90 04	BCC	CRATE2	
B146 A9 12	LDA	##12	
B148 A2 0F	LDX	##0F	
B14A		CRATE2	
B14A 85 CD	STA	ENDRAT	
B14C AB	TAY		
B14D 8A	TXA		
B14E C0 00	CPY	##00	
B150 F0 0B	BEQ	CRATE4	
B152 C0 0B	CPY	##0B	
B154 90 04	BCC	CRATE5	
B156 C0 0F	CPY	##0F	
B158 90 03	BCC	CRATE4	
B15A		CRATE5	
B15A 4A	LSR	A	
B15B 49 0B	EOR	##0B	
B15D		CRATE4	
B15D 29 0F	AND	##0F	
B15F 85 CE	STA	ENDCLS	
B161		CRATE3	
B161 60	RTS		
B162		CSERVE	
B162 A5 C0	LDA	SERVICE GALACTIC CHART	
B164 D0 04	BNE	HFLAG ; HWARP ON ?	
B166 A5 D0	LDA	CSERV9 ; YES	
B168 30 01	BMI	DISFLG ; DOING GALACTIC CHART ?	
B16A		CSERV1 ; NO	
B16A 60	RTS		
B16B		CSERV1	
B16B 2C 97 09	BIT	DAMAGE+5 ; COMMUNICATIONS	
B16E 30 03	BMI	CSER10	
B170 20 B9 B4	JSR	LDGALT ; LD UP THE CHART	
B173		CSER10	
B173 A5 72	LDA	TIMERX ; SLOW DOWN CURSOR MOVE	
B175 29 01	AND	##01	
B177 D0 2E	BNE	CSERVB	
B179 1B	CLC	UPDATE HORIZ CURSOR POS	

B1DA 80 04	BCS	CSERV4	
B1DC 49 FF	EOR	#1FF	
B1DE 69 01	ADC	#101	
B1E0	CSERV4		
B1E0 4A	LSR	A	
B1E1 18	CLC		
B1E2 65 6A	ADC	TEMP	
B1E4 AB	TAY		
B1E5 4A	LSR	A	
B1E6 4A	LSR	A	
B1E7 4A	LSR	A	
B1E8 AA	TAX		
B1E9 98	TYA		
B1EA 29 03	AND	#103	
B1EC 18	CLC		
B1ED 7D DD DA	ADC	ENG TAB, X	
B1F0 85 91	STA	HYPENQ	
B1F2 AB	TAY		
B1F3 A9 10	LDA	#110	
B1F5 8D 7D 09	STA	DWENER+0	
B1F8 8D 7E 09	STA	DWENER+1	
B1FB 8D 7F 09	STA	DWENER+2	
B1FE	CSERV6		
B1FE A2 02	LDX	#102	
B200	CSERV5		
B200 FE 7D 09	INC	DWENER, X	
B203 BD 7D 09	LDA	DWENER, X	
B206 C9 1A	CMP	#11A	
B208 90 08	RCC	CSERV7	
B20A A9 10	LDA	#110	
B20C 9D 7D 09	STA	DWENER, X	
B20F CA	DEX		
B210 10 EE	BPL	CSERV5	
B212	CSERV7		
B212 88	DEY		
B213 D0 E9	BNE	CSERV6	
B215 60	RTS		
B216	MSERVE		
SERVICE MESSAGE			
B216 A5 D1	LDA	SENPTR	MESSAGE ON ?
B218 F0 05	BEG	LDMS14	NO
B21A C6 CF	DEC	MESTIM	TIMED OUT ?
B21C F0 10	BEG	LDMES1	YES
B21E	LDMES2		
B21E 60	RTS		
B21F	LDMS14		
B21F A4 65	LDY	REPMSG	REPEAT THE MESSAGE ?
B221 F0 FB	BEG	LDMES2	NO
B223	LDMESS	ENTRY POINT TO INIT MESSAGE *****	
B223 84 D1	STY	SENPTR	
B225 A0 23	LDY	#LISTB6-LISTAB	
B227 A2 0F	LDX	#DISPL2-DISPLY	
B229 A9 07	LDA	#107	
B22B 20 F1 AD	JSR	LDISP	REVISE DIPLAY LIST FOR MESSAGE
B22E	LDMES1		
B22E A2 13	LDX	#19	CLEAR MESSAGE RAM

B230 A9 00	LDA	##00	
B232 B5 6B	STA	TEMP1	; CLEAR DISPLAY POINTER
B234			
B234 9D 1F 0D	STA	MESSAGE,X	
B237 CA	DEX		
B238 10 FA	BPL	LDMES3	
B23A			
B23A A6 D1	LDX	SENPTR	; NEW WORD PNTR
B23C E6 D1	INC	SENPTR	; ADVANCE TO NEXT WORD
B23E D0 09	BNE	LDMES5	
			MESSAGE DONE
B240 A2 0F	LDX	#DISPL2-DISPLY	
B242 A0 80	LDY	##80	
B244 A9 07	LDA	##07	
B246 4C F1 AD	JMP	LDISP	; RESTORE DISPLAY LIST
B249			
B249 BD AA BB	LDA	SENTAB,X	; A =NEW WORD
B24C C9 FC	CMP	##FC	; CLASS ?
B24E D0 0F	BNE	LDMES6	; NO
B250 A4 CE	LDY	ENDCLS	
B252 B9 FC BE	LDA	CLASTB,Y	; VALUE 1-5, IN DMA ASCII
B255 A6 6B	LDX	TEMP1	; WHERE TO STORE
B257 9D 1F 0D	STA	MESSAGE,X	
B25A A9 3C	LDA	##60	; END OF LINE
B25C B5 CF	STA	MESTIM	; WAIT 1 SECOND
B25E 60	RTS		
B25F			
B25F C9 FD	CMP	##FD	; RANK ?
B261 D0 05	BNE	LDMS12	; NO
B263 A4 CD	LDY	ENDRAT	
B265 B9 E9 BE	LDA	RANKTB,Y	; RANK WORD
B268			
B268 B5 6C	STA	TEMP2	; STORE FOR BITS 7,6
B26A 29 3F	AND	##3F	
B26C B5 6A	STA	TEMP	; WORD LOC IN #WRDTAB
B26E A9 2A	LDA	#WRDTAB-1	
B270 B5 6B	STA	PNTR	
B272 A9 BC	LDA	#WRDTAB-1/256	
B274 B5 69	STA	PNTR+1	; WHERE TO START SEARCH
B276			
B276 E6 6B	INC	PNTR	; ADVANCE WORD POINTER
B278 D0 02	BNE	LDMES8	
B27A E6 69	INC	PNTR+1	
B27C			
B27C A0 00	LDY	##00	
B27E B1 6B	LDA	(PNTR),Y	
B280 10 F4	BPL	LDMES7	; NOT START OF A WORD
B282 C6 6A	DEC	TEMP	; IS IT THE RIGHT WORD?
B284 D0 F0	BNE	LDMES7	; NO
B286			
B286 29 3F	AND	##3F	; REMOVE ANY FLAG BITS
B288 49 A0	EOR	##A0	; PLAYFIELD AND DMA ASCII
B28A A6 6B	LDX	TEMP1	; DISPLAY POINTER
B28C E6 6B	INC	TEMP1	; ADVANCE DIPLAY POINTER
B28E 9D 1F 0D	STA	MESSAGE,X	
B291 CB	INY		; NEXT LETTER
B292 B1 6B	LDA	(PNTR),Y	; A=LETTER
B294 10 F0	BPL	LDMES9	
B296 E6 6B	INC	TEMP1	; A SPACE

END OF WORD FOUND

B298 A9 3C	LDA	#60	; WAIT 1 SECOND
B29A 24 6C	BIT	TEMP2	; WHAT TO DO NEXT
B29C 10 04	BPL	LDMS11	; NOT END OF LINE
B29E 50 08	BVC	LDMS10	; END OF LINE ONLY
B2A0 A9 FE	LDA	##FE	; WAIT 4 SECONDS, END OF SENTENCE
B2A2	LDMS11		
B2A2 50 96	BVC	LDMS4	; CONTINUE WITH LINE
B2A4 A0 FF	LDY	##FF	; END OF SENTENCE
B2A6 84 D1	STY	SENPTR	
B2A8	LDMS10		
B2A8 85 CF	STA	MESTIM	; STORE WAIT
B2AA 60	RTS		

B2AB

AUDIO

AUDIO SERVICE ROUTINE

CH4 NOTE SECTION

B2AB A5 D6	LDA	NPRIOR	
B2AD F0 37	BEG	AUDIO1	
B2AF C6 D8	DEC	NDURTM	; TIMING OUT ?
B2B1 10 33	BPL	AUDIO1	; YES
B2B3 A5 D9	LDA	NOTVOL	
B2B5 F0 0A	BEG	AUDIO2	; NEXT NOTE
B2B7 A5 D5	LDA	SDURAT	; SPACE BETWEEN NOTE
B2B9 30 06	BMI	AUDIO2	
B2BB 85 D8	STA	NDURTM	
B2BD A0 00	LDY	##00	
B2BF F0 20	BEG	AUDIO3	; JUMP
B2C1	AUDIO2		
B2C1 A5 D4	LDA	NDURAT	
B2C3 85 D8	STA	NDURTM	
B2C5 A6 D2	LDX	NOTSEQ	
B2C7 E6 D2	INC	NOTSEQ	
B2C9 BD 5C BF	LDA	NOTTAB, X	
B2CC 8D 06 D2	STA	AUDF4	
B2CF A0 A8	LDY	##A8	
B2D1 C9 FF	CMP	##FF	
B2D3 D0 0C	BNE	AUDIO3	
B2D5 A5 D7	LDA	REPPTTR	
B2D7 85 D2	STA	NOTSEQ	
B2D9 C6 D3	DEC	REPSEQ	
B2DB 10 E4	BPL	AUDIO2	
B2DD A0 00	LDY	##00	
B2DF 84 D6	STY	NPRIOR	
B2E1	AUDIO3		
B2E1 8C 07 D2	STY	AUDC4	
B2E4 84 D9	STY	NOTVOL	
B2E6	AUDIO1		
B2E6 A5 E2	LDA	EXPDEL	; ZYLON HIT SERVICE
B2E8 F0 09	BEG	AUD11	
B2EA C6 E2	DEC	EXPDEL	
B2EC D0 05	BNE	AUD11	
B2EE A2 14	LDX	#NOITB2-NOISTB	
B2F0 20 A8 AE	JSR	NOISE	
B2F3	AUD11		
B2F3 A6 70	LDX	SPEED	

B2F5	8A	TXA	
B2F6	4A	LSR	A
B2F7	4A	LSR	A
B2F8	4A	LSR	A
B2F9	4A	LSR	A
B2FA	4A	LSR	A
B2FB	C5 E1	CMP	AUDTIM
B2FD	90 2C	BCC	AUD10
B2FF	A9 00	LDA	#\$00
B301	85 E1	STA	AUDTIM

ENGINES

B303	E8	INX	
B304	8A	TXA	
B305	49 FF	EDR	##FF
B307	8D 04 D2	STA	AUDF3
B30A	AA	TAX	
B30B	0A	ASL	A
B30C	0A	ASL	A
B30D	0A	ASL	A
B30E	0A	ASL	A
B30F	0A	ASL	A
B310	8D 00 D2	STA	AUDF1
B313	8A	TXA	
B314	4A	LSR	A
B315	4A	LSR	A
B316	4A	LSR	A
B317	8D 02 D2	STA	AUDF2
B31A	4A	LSR	A
B31B	49 8F	EDR	##8F
B31D	8D 03 D2	STA	AUDC2
B320	29 87	AND	##87
B322	8D 05 D2	STA	AUDC3
B325	A9 70	LDA	#\$70
B327	8D 08 D2	STA	AUDCTL
B32A	60	RTS	

AUD10

B32B	A5 DB	LDA	AUDEXP	EXPLOSION SERVICE
B32D	F0 08	BEG	AUD104	

B32F	C6 DB	DEC	AUDEXP
B331	D0 04	BNE	AUD104
B333	A9 8F	LDA	##8F

B335	85 DC	STA	ATYPE2
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AUD104

B337	A6 DA	LDX	PHOREP	PHOTON SERVICE
------	-------	-----	--------	----------------

B339	F0 1C	BEG	AUD105
B33B	C6 DA	DEC	PHOREP
B33D	D0 0A	BNE	AUD12

B33F	A9 AF	LDA	##AF
------	-------	-----	------

B341	85 DC	STA	ATYPE2
------	-------	-----	--------

B343	A9 02	LDA	##02
------	-------	-----	------

B345	85 DE	STA	AFREQ1
------	-------	-----	--------

B347	85 DF	STA	AFREQ2
------	-------	-----	--------

AUD12

B349	8D EA BF	LDA	PHOTB2-1, X
------	----------	-----	-------------

B34C	85 DD	STA	ATYPE3
------	-------	-----	--------

B34E	8D F2 BF	LDA	PHOTB4-1, X
------	----------	-----	-------------

B351	8D 04 D2	STA	AUDF3
------	----------	-----	-------

B354	8D 09 D2	STA	STIMER
------	----------	-----	--------

AUD105

B357	A5 E3	LDA	BIGEXP	FINAL EXPLOS SERVICE
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B359 F0 0E      BEQ      AUDIO6
B35B C6 E3      DEC      BIGEXP
B35D AD 04 D2   LDA      RANDOM
B360 BD 04 D2   STA      AUDF3
B363 29 20      AND      #120
B365 45 DD      EOR      ATYPE3
B367 B5 DD      STA      ATYPE3
B369             AUDIO6

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B369 18          CLC          SWEEP DOWN CH1-2
B36A A5 DE      LDA          AFREQ1
B36C 65 E0      ADC          AUDADD
B36E B5 DE      STA          AFREQ1
B370 BD 00 D2   STA          AUDF1
B373 A5 DF      LDA          AFREQ2
B375 69 00      ADC          #00
B377 B5 DF      STA          AFREQ2
B379 BD 02 D2   STA          AUDF2

```

VOLUME CONTROL

```

B37C A6 DC      LDX          ATYPE2
B37E A4 DD      LDY          ATYPE3
B380 A5 72      LDA          TIMERX
B382 4A          LSR          A
B383 90 1A      BCC          AUDIO7
B385 A5 E1      LDA          AUDTIM
B387 F0 16      BEQ          AUDIO7
B389 C6 E1      DEC          AUDTIM
B38B C9 11      CMP          #11
B38D B0 10      BCS          AUDIO7
B38F BA          TXA
B390 29 0F      AND          #0F
B392 F0 03      BEQ          AUDIO8
B394 CA          DEX
B395 B6 DC      STX          ATYPE2
B397             AUDIO8
B397 9B          TYA
B39B 29 0F      AND          #0F
B39A F0 03      BEQ          AUDIO7
B39C B8          DEY
B39D B4 DD      STY          ATYPE3
B39F             AUDIO7
B39F BE 03 D2   STX          AUDC2
B3A2 BC 05 D2   STY          AUDC3
B3A5 60          RTS

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B3A6             NOTINT

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```

B3A6 BD 3E BF   LDA          AUDIO NOTE INIT, X=CH4TAB PNTR
B3A9 C5 D6      CMP          CH4TAB, X
B3AB 90 0C      BCC          NPRIOR
B3AD A0 05      LDY          NOTIN2
B3AF             #05

```

```

B3AF BD 3E BF   LDA          CH4TAB, X
B3B2 99 D2 00   STA          NOTSEQ, Y
B3B5 E8          INX
B3B6 B8          DEY
B3B7 10 F6      BPL          NOTIN1
B3B9             NOTIN2

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```

B3B9 60          RTS

```

B3BA LDTABS
INIT PTAB, BCDCON, VCONL, VCONH, DISCTL, CHTRAM

B3BA A2 59 LDX #89
B3BC LDTB10
B3BC A9 0D LDA #0D
B3BE 9D 85 02 STA DISPLY+5, X
B3C1 E0 0A CPX #0A
B3C3 B0 05 BCS LDTABB
LD PF COLORS
B3C5 BD A9 BF LDA CLITAB, X
B3C8 95 F2 STA COLRAM+4, X
B3CA LDTABB
B3CA CA DEX
B3CB 10 EF BPL LDTB10
B3CD A9 70 LDA #70
B3CF 8D 80 02 STA DISPLY+0
B3D2 8D 81 02 STA DISPLY+1
B3D5 A9 41 LDA #41
B3D7 8D E7 02 STA DISPLY+103
B3DA A9 80 LDA #DISPLY
B3DC 8D E8 02 STA DISPLY+104
B3DF A9 02 LDA #DISPLY/256
B3E1 8D E9 02 STA DISPLY+105

B3E4 A2 00 LDX #00
B3E6 86 68 STX PNTR
B3E8 86 69 STX PNTR+1
B3EA 86 6A STX TEMP
B3EC 86 6B STX TEMP1
B3EE LDTAB1
B3EE 18 CLC
B3EF A5 68 LDA PNTR
B3F1 69 51 ADC #SCPTAB
B3F3 85 68 STA PNTR
B3F5 A5 69 LDA PNTR+1
B3F7 9D E9 0D STA PTAB, X
B3FA 69 00 ADC #00
B3FC 85 69 STA PNTR+1
B3FE 18 CLC
B3FF A5 6A LDA TEMP
B401 69 64 ADC #SCBCD
B403 85 6A STA TEMP
B405 A5 68 LDA TEMP1
B407 9D E9 0E STA BCDCON, X
B40A F8 SED
B40B 69 00 ADC #00
B40D D8 CLD
B40E 85 6B STA TEMP1
B410 E8 INX
B411 D0 DB BNE LDTAB1

B413 A2 00	LDX	##00	
B415 B6 6B	STX	PNTR	
B417 A9 10	LDA	#NEMMAP/256	
B419 B5 69	STA	PNTR+1	
B41B	LDTAB2		
B41B 1B	CLC		
B41C A5 6B	LDA	PNTR	
B41E 9D 00 0B	STA	VCONL, X	
B421 69 2B	ADC	#SCVCON	
B423 B5 6B	STA	PNTR	
B425 A5 69	LDA	PNTR+1	
B427 9D 64 0B	STA	VCONH, X	
B42A 69 00	ADC	##00	
B42C B5 69	STA	PNTR+1	
B42E BD 42 BB	LDA	STINIT, X	
B431 9D 49 09	STA	DISCTL, X	
B434 E8	INX		
B435 E0 64	CPX	#100	
B437 90 E2	BCC	LDTAB2	
B439 CA	DEX		; X=99, DONT JUMP IMMEDIATELY
B43A B6 7B	STX	JMPTIM	
B43C A2 03	LDX	##03	
B43E BE 11 09	STX	CHTRAM+72	; NOTHING IN SHIPS INIT QUAD
B441	LDTAB3		
B441 BD A6 BB	LDA	CHRTAB, X	
B444 B5 6A	STA	TEMP	
B446 A4 62	LDY	MISDIF	
B448 C8	INY		
B449 C8	INY		
B44A B4 6B	STY	TEMP1	
B44C	LDTAB4		
B44C AD 0A D2	LDA	RANDOM	
B44F 29 7F	AND	##7F	
B451 A8	TAY		
B452 B9 C9 0B	LDA	CHTRAM, Y	
B455 D0 F5	BNE	LDTAB4	
B457 A5 6A	LDA	TEMP	
			STARBASES NOT ON EDGES
B459 10 21	BPL	LDTAB7	
B45B C0 10	CPY	##10	
B45D 90 ED	BCC	LDTAB4	
B45F C0 70	CPY	##70	
B461 B0 E9	BCS	LDTAB4	
B463 9B	TYA		
B464 29 0F	AND	##0F	
B466 F0 E4	BEQ	LDTAB4	
B46B C9 0F	CMP	##0F	
B46A F0 E0	BEQ	LDTAB4	
B46C B9 C8 0B	LDA	CHTRAM-1, Y	
B46F 19 CA 0B	DRA	CHTRAM+1, Y	
B472 19 D9 0B	DRA	CHTRAM+16, Y	
B475 19 B9 0B	DRA	CHTRAM-16, Y	
B47B D0 D2	BNE	LDTAB4	
B47A A5 6A	LDA	TEMP	
B47C	LDTAB7		
B47C 99 C9 0B	STA	CHTRAM, Y	
B47F C6 6B	DEC	TEMP1	
B4B1 10 C9	BPL	LDTAB4	

```

B483 CA          DEX
B484 10 BB       BPL      LD TAB3
                        LOAD HORIZ WALL OF CHART
B485 A2 B4       LDX      #180          ; CLEAR ALL CHART FIRST
B486          LD TAB5
B488 A9 0A       LDA      #$0A
B48A 9D 34 0D    STA      CHTDIS-1,X
B48D CA          DEX
B48E D0 F8       BNE      LD TAB5
B490 A2 0F       LDX      #$0F          ; LD HORIZ LINE
B492          LD TAB6
B492 A9 18       LDA      #$18
B494 9D 37 0D    STA      CHTDIS+2,X
B497 CA          DEX
B498 10 F8       BPL      LD TAB6
B49A A9 1A       LDA      #$1A          ; FILL IN THE DOT ON THE CHART
B49C 8D 47 0D    STA      CHTDIS+1B
B49F A9 00       LDA      #$00
B4A1 8D 11 09    STA      CHTRAM+72
B4A4 A9 48       LDA      #72
B4A6 85 90       STA      QUADRT
B4A8 A9 43       LDA      #67
B4AA 85 8D       STA      GHPOS
B4AC 85 8F       STA      HYHPOS
B4AE A9 47       LDA      #$47
B4B0 85 8E       STA      HYVPOS
B4B2 85 8C       STA      GVPQS
B4B4 A9 EA       LDA      #$EA
B4B6 8D E8 0F    STA      BCDCON+255          ; INFIINITY SIGN
;
; FALL THROUGH TO LDGALT
;
B4B9          LDGALT
;
; LD UP THE GALACTIC CHART
; TRANSFER CHTRAM TO CHTDIS
;
B4B9 A0 00       LDY      #$00          ; CHTDIS PNTR
B4BB 84 6A       STY      TEMP          ; CHTRAM PNTR
B4BD          LDGAL1
B4BD A6 6A       LDX      TEMP
B4BF BD C9 08    LDA      CHTRAM,X          ; WHATS IN QUAD
B4C2 10 02       BPL      LDGAL2
B4C4 A9 05       LDA      #$05          ; NO
; STARBASE DEFAULT
B4C6          LDGAL2
B4C6 AA          TAX
B4C7 BD D1 BE    LDA      CHTABL,X          ; CODE FOR CHTDIS
B4CA 99 4B 0D    STA      CHTDIS+22,Y
B4CD C8          INY
B4CE E6 6A       INC      TEMP
B4D0 A5 6A       LDA      TEMP
B4D2 29 0F       AND      #$0F          ; END OF LINE ?
B4D4 D0 E7       BNE      LDGAL1          ; NO
B4D6 A9 19       LDA      #$19          ; VERT LINE
B4D8 99 4B 0D    STA      CHTDIS+22,Y
B4DB C8          INY
B4DC C8          INY
B4DD C8          INY          ; ADVANCE TO NEXT LINE

```


B4DE C8	INY		
B4DF C0 A0	CPY	#160	; ALL DONE ?
B4E1 90 DA	BCC	LDGAL1	; NO
B4E3 80	RTS		

B4E4

TIMERS

SERVICE TIMERS, STARDATE AND ZYLON JUMP
UPDATE TIMEX, USED FOR STAR INTENSITY MULTIPLEX

B4E4 E6 76	INC	BINTIM	; UPDATE BINARY TIMER
B4E6 A2 90	LDX	#DIMBLU	
B4E8 A5 76	LDA	BINTIM	
B4EA 10 09	BPL	TIME46	
B4EC AC 55 09	LDY	DENERG+0	
B4EF C0 80	CPY	##80	
B4F1 D0 02	BNE	TIME46	
B4F3 A2 44	LDX	#RED	
B4F5		TIME46	
B4F5 29 03	AND	##03	
B4F7 85 72	STA	TIMERX	
B4F9 D0 1F	BNE	TIME33	
		SHIELDS SECTION	
B4FB A4 7D	LDY	SHENER	
B4FD F0 17	BEQ	TIME31	
B4FF A0 A0	LDY	#DBLUE	
B501 2C 94 09	BIT	DAMAGE+2	
B504 10 0B	BPL	TIME47	
B506 70 07	BVS	TIME32	
B508 AD 0A D2	LDA	RANDOM	
B50B C9 C8	CMP	#200	
B50D 90 07	BCC	TIME31	
B50F		TIME32	
B50F A0 00	LDY	##00	
B511		TIME47	
B511 9B	TYA		
B512 D0 02	BNE	TIME31	
B514 A2 26	LDX	#YELLOW	
B516		TIME31	
B516 B4 B1	STY	SPABAK	
B518 B6 FB	BTX	COLRAM+13	
B51A		TIME33	
		END UPDATE TIMERX	
		PHOTON TIMEOUT	
B51A A2 02	LDX	##02	
B51C		TIMER6	
B51C BD BE 0C	LDA	GINDEX+2, X	; PHOTON ?
B51F D0 06	BNE	TIMER7	
B521 B5 EB	LDA	STFLAG+2, X	; PHOTON TIMEOUT ?
B523 F0 02	BEQ	TIMER7	; YES
B525 D6 EB	DEC	STFLAG+2, X	; DEC PHOTON TIMER
B527		TIMER7	
B527 CA	DEX		
B528 10 F2	BPL	TIMER6	

EXPLOSION TIMEOUT

```

B52A A5 73      LDA      ETIMER
B52C F0 16      BEQ       TIME10
B52E C6 73      DEC       ETIMER
B530 D0 04      BNE       TIMER9
B532 A2 11      LDX       #STLAST+1      ; 1 FOR FALL THROUGH
B534 B6 79      STX       NSTARS
B536              TIMER9
B536 C9 70      CMP       #$70
B538 B0 04      BCS       TIME30
B53A A2 00      LDX       #$00
B53C B6 BA      STX       HITME
B53E              TIME30
B53E C9 18      CMP       #$18
B540 B0 02      BCS       TIME10
B542 C6 79      DEC       NSTARS
B544              TIME10
B544 C6 74      DEC       SECOND
B546 10 21      BPL       TIMER1
B548 A9 28      LDA       #$28
B54A B5 74      STA       SECOND
B54C A2 04      LDX       #$04
B54E              TIMER2
B54E FE A3 09   INC       DSDATE, X
B551 BD A3 09   LDA       DSDATE, X
B554 C9 DA      CMP       #$DA
B556 90 0D      BCC       TIMER3
B558 A9 D0      LDA       #$D0
B55A 9D A3 09   STA       DSDATE, X
B55D E0 03      CPX       #$03
B55F D0 01      BNE       TIMER4
B561 CA          DEX
B562              TIMER4
B562 CA          DEX
B563 10 E9      BPL       TIMER2
B565              TIMER3
B565 C4 78      DEC       JMPTIM
B567 30 01      BMI       TIMER5
B569              TIMER1
B569 60          RTS
B56A              TIMER5
B56A A9 31      LDA       #49
B56C B5 78      STA       JMPTIM
B56E A5 CB      LDA       RATING DUE TO TIME
B570 D0 02      BNE       TIME61
B572 C6 CC      DEC       RATING+1
B574              TIME61
B574 C6 CB      DEC       RATING
B576 A6 64      LDX       ATRACT      ; GAME OVER ?
B578 D0 EF      BNE       TIMER1      ; YES
              ZYLONS JUMP
              ; CHECK ALL STARBASES TO SEE IF DESTROYED
              ; X=0 FROM ABOVE
B57A B6 6A      STX       TEMP
B57C              TIME12
B57C BD C9 0B   LDA       CHTRAM, X      ; STARBASE ?
B57F 10 19      BPL       TIME11      ; NO
B581 20 F1 B7   JSR       TIMHLP
B584 F0 14      BEQ       TIME11

```

STARBASE DESTROYED

```

B586 A9 02      LDA    #002      ; 4 ZYLONS
B588 9D C9 08    STA    CHTRAM, X
B58D 85 6A      STA    TEMP
B58D 38          SEC
B58E A5 CB      LDA    RATING
B590 E9 12      SBC    #18
B592 85 CB      STA    RATING
B594 A5 CC      LDA    RATING+1
B596 E9 00      SBC    #00
B598 85 CC      STA    RATING+1

```

```

B59A          TIME11
B59A E8          INX
B59B 10 DF      BPL    TIME12
B59D A5 6A      LDA    TEMP      ; ANY STARBASES DESTROYED ?
B59F F0 0F      BEQ    TIME13      ; NO
B5A1 2C 97 09   BIT    DAMAGE+5      ; COMMUNICATIONS
B5A4 70 0A      BVS    TIME13
B5A6 A0 15      LDY    #SENDES-SENTAB
B5A8 20 23 B2    JSR    LDMESS
B5AB A2 18      LDX    #CH4TB5-CH4TAB      ; MESSAGE
B5AD 20 A5 B3    JSR    NOTINT
B5B0          TIME13

```

```

B5B0 C6 9F      DEC    JMPDUT      ; JUMP TIMEOUT
B5B2 30 07      BMI    TIME28
B5B4 A6 93      LDX    KILBAS
B5B6 BD C9 08   LDA    CHTRAM, X      ; NEED A NEW BASE ?
B5B9 30 1F      BMI    TIME14      ; NO
B5BB          TIME28

```

```

B5BB A9 07      LDA    #07      ; JUMP TIMEOUT RESTORED
B5BD B5 9F      STA    JMPDUT
B5BF A0 7F      LDY    #127

```

```

B5C1          TIME15
B5C1 AD 0A D2   LDA    RANDOM
B5C4 29 7F      AND    #$7F
B5C6 AA          TAX
B5C7 BD C9 08   LDA    CHTRAM, X
B5CA 30 0E      BMI    TIME14      ; NEW BASE
B5CC 88          DEY
B5CD 10 F2      BPL    TIME15      ; TRY AGAIN
B5CF A2 7F      LDX    #127

```

```

B5D1          TIME16
B5D1 BD C9 08   LDA    CHTRAM, X
B5D4 30 04      BMI    TIME14
B5D6 CA          DEX
B5D7 10 FB      BPL    TIME16
B5D9 60          RTS

```

```

B5DA          TIME14
B5DA B6 93      STX    KILBAS      ; STORE STXRBASE
B5DC 8A          TXA
B5DD 29 0F      AND    #0F
B5DF 85 94      STA    KILOCH
B5E1 8A          TXA
B5E2 4A          LSR    A
B5E3 4A          LSR    A
B5E4 4A          LSR    A
B5E5 4A          LSR    A
B5E6 85 95      STA    KILOCV
B5E8 A2 FF      LDX    #$FF

```

B5EA	TIME18	INX	MAIN LOOP
B5EA E8		BPL	TIME40
B5EB 10 30			END ZYLDN JUMP ROUTINE
B5ED A2 00		LDX	#400
B5EF	TIME20		
B5EF BD C9 08		LDA	CHTRAM, X
B5F2 29 DF		AND	#5DF
B5F4 9D C9 08		STA	CHTRAM, X
B5F7 E8		INX	
B5F8 1Q F5		BPL	TIME20
B5FA 2C 97 09		BIT	DAMAGE+5
B5FD 70 1D		BVS	TIME44
B5FF A2 00		LDX	#400
			ANY STARBASES SURROUNDED ?
B601	TIME21		
B601 BD C9 08		LDA	CHTRAM, X
B604 1Q 13		BPL	TIME19
B606 20 F1 B7		JSR	TIMHLP
B609 F0 0E		BEG	TIME19
			STAR BASE SURROUNDED
B60B A9 63		LDA	#99
B60D 85 78		STA	JMPTIM
B60F A0 13		LDY	#SENSUR-SENTAB
B611 20 23 B2		JSR	LDMESS
B614 A2 18		LDX	#CH4TB5-CH4TAB
B616 4C A6 B3		JMP	NOTINT
B619	TIME19		
B619 E8		INX	
B61A 10 E5		BPL	TIME21
B61C	TIME44		
B61C 60		RTS	
B61D	TIME40		
B61D BC C9 08		LDY	CHTRAM, X
B620 C0 0A		CPY	#40A
B622 B0 C6		BCS	TIME18
B624 AD 0A D2		LDA	RANDOM
B627 D9 BB BF		CMP	JMPWHN, Y
B62A B0 BE		BCS	TIME18
B62C E4 90		CPX	QUADRT
B62E F0 BA		BEG	TIME18
			CALCULATE GRADIENT
B630 A0 08		LDY	#40B
B632	TIME27		
B632 18		CLC	
B633 BA		TXA	
B634 79 C0 BF		ADC	JMPTAB, Y
B637 B5 6A		STA	TEMP
B639 29 0F		AND	#40F
B63B 38		SEC	
B63C E5 74		SBC	KILOCH
B63E B0 04		BCS	TIME26
B640 49 FF		EOR	#4FF
B642 69 01		ADC	#401
B644	TIME26		
B644 B5 6B		STA	TEMP1
B646 A5 6A		LDA	TEMP
B648 4A		LSR	A
B649 4A		LSR	A
B64A 4A		LSR	A
B64B 4A		LSR	A

B64C 38	SEC	
B64D E5 95	SBC	KILOCV
B64F B0 04	BCS	TIME22
B651 49 FF	EOR	##FF
B653 69 01	ADC	##01
B655	TIME22	
B655 18	CLC	
B656 65 6B	ADC	TEMP1
B658 99 96 00	STA	JMPPTS, Y
B65B 88	DEY	
B65C 10 D4	BPL	TIME27
		ZYLON CONVERGENCE
B65E A9 01	LDA	##01
B660 B5 6B	STA	TEMP1
B662	TIME23	
B662 A0 07	LDY	##07
B664	TIME24	
B664 B9 96 00	LDA	JMPPTS, Y
B667 C5 9E	CMP	JMPPTS+B
B669 B0 24	BCS	TIME42
B66B 18	CLC	
B66C 8A	TXA	
B66D 79 C0 BF	ADC	JMPTAB, Y
B670 30 1D	BMI	TIME42
B672 84 6A	STY	TEMP
B674 A8	TAY	
B675 B9 C9 08	LDA	CHTRAM, Y
B678 D0 13	BNE	TIME25
B67A BD C9 08	LDA	CHTRAM, X
B67D C4 90	CPY	QUADRT
B67F F0 0C	BEQ	TIME25
B681 09 20	ORA	##20
B683 99 C9 08	STA	CHTRAM, Y
B686 A9 00	LDA	##00
B688 9D C9 08	STA	CHTRAM, X
B68B F0 0B	BEQ	TIME45
B68D	TIME25	
B68D A4 6A	LDY	TEMP
B68F	TIME42	
B68F 88	DEY	
B690 10 D2	BPL	TIME24
B692 E6 9E	INC	JMPPTS+B
B694 C6 6B	DEC	TEMP1
B696 10 CA	BPL	TIME23
B698	TIME45	
B69B 4C EA B5	JMP	TIME18

B69B ROHELP

B69B BD AD 09	LDA	HELPER SUB FOR YROTAT, ZROTAT
B69E 49 01	EOR	XSIGN, X
B6A0 F0 02	BEQ	##01
B6A2 A9 FF	LDA	ROHLP1
B6A4	ROHLP1	##FF
B6A4 B5 6B	STA	TEMP1
B6A6 B5 6C	STA	TEMP2
B6A8 BD 40 0A	LDA	XPOSH, X
B6AB B5 6A	STA	TEMP

B6AD	AD	0A	D2	LDA	RANDOM
B6B0	09	BF		ORA	##BF
B6B2	5D	D3	0A	EOR	XPSL, X
B6B5	0A			ASL	A
B6B6	26	6A		ROL	TEMP
B6B8	26	6B		ROL	TEMP1
B6BA	0A			ASL	A
B6BB	26	6A		ROL	TEMP
B6BD	26	6B		ROL	TEMP1

B6BF	A5	6D	LDA	TEMP3	JOYSTICK
B6C1	49	FF	EOR	##FF	TOGGLES EVERY TIME THROUGH, CALL TWICE/STAR
B6C3	85	6D	STA	TEMP3	THEN OK, THIS CAN BE TRICKY SO WATCH OUT !!

B6C5	30	1A	BMI	ROHLP2	
B6C7	18		CLC		
B6C8	B9	D3	0A	LDA	XPSL, Y
B6CB	65	6A		ADC	TEMP
B6CD	99	D3	0A	STA	XPSL, Y
B6D0	B9	40	0A	LDA	XPSH, Y
B6D3	65	6B		ADC	TEMP1
B6D5	99	40	0A	STA	XPSH, Y
B6D8	B9	AD	09	LDA	XSIGN, Y
B6DB	65	6C		ADC	TEMP2
B6DD	99	AD	09	STA	XSIGN, Y
B6E0	60		RTS		

B6E1			ROHLP2		
B6E1	38		SEC		
B6E2	B9	D3	0A	LDA	XPSL, Y
B6E5	E5	6A		SBC	TEMP
B6E7	99	D3	0A	STA	XPSL, Y
B6EA	B9	40	0A	LDA	XPSH, Y
B6ED	E5	6B		SBC	TEMP1
B6EF	99	40	0A	STA	XPSH, Y
B6F2	B9	AD	09	LDA	XSIGN, Y
B6F5	E5	6C		SBC	TEMP2
B6F7	99	AD	09	STA	XSIGN, Y
B6FA	60		RTS		

B6FB			STHPOS		
B6FB	C9	50		CMP	STORE HPOS, X=STR INDEX
B6FD	B0	5B		BCS	#HOFLOW
B6FF	85	6D		STA	STVPS1
B701	A9	50		LDA	TEMP3
B703	E0	05		CPX	#HSTCEN
B705	B0	02		BCS	#DBJNUM
B707	A9	7D		LDA	STHPS2
B709					#HOBCE

B709			STHPS2		
B709	BC	DE	09	LDY	YSIGN, X
B70C	D0	09		BNE	STHPS3
B70E	38			SEC	
B70F	E6	6D		INC	TEMP3
B711	E5	6D		SBC	TEMP3
B713	9D	2A	0C	STA	HPOS, X
B716	60			RTS	
B717			STHPS3		
B717	18			CLC	

B718 65 6D ADC TEMP3
 B71A 9D 2A 0C STA HPDS, X
 B71D 60 RTS

B71E STVPOS
 ; STORE VPOS, X=STAR INDEX

B71E C9 32 CMP #VOFLOW
 B720 B0 38 BCS STVPS1
 B722 B5 6D STA TEMP3
 B724 A9 32 LDA #VSTCEN
 B726 E0 05 CPX #OBJNUM
 B728 B0 04 BCS STVPS2
 B72A 06 6D ASL TEMP3
 B72C A9 7A LDA #VOBCEN

B72E STVPS2
 B72E 24 D0 BIT DISFLG ; SECTOR SCAN ?
 B730 50 13 BVC STVPS5 ; NO
 B732 2C 96 09 BIT DAMAGE+4
 B735 10 07 BPL STVPS7
 B737 2C 0A D2 BIT RANDOM
 B73A 50 0E BVC STVPS4
 B73C 70 15 BVS STVPS3
 B73E STVPS7

B73E BC AD 09 LDY XSIGN, X
 B741 D0 07 BNE STVPS6
 B743 F0 0E BEQ STVPS3 ; JUMP

B745 STVPS5
 B745 BC 0F 0A LDY ZSIGN, X
 B748 F0 09 BEQ STVPS3

B74A STVPS6
 B74A 38 SEC
 B74B E6 6D INC TEMP3
 B74D E5 6D SBC TEMP3
 B74F 9D F9 0B STA VPOS, X
 B752 60 RTS

B753 STVPS3
 B753 18 CLC
 B754 65 6D ADC TEMP3
 B756 9D F9 0B STA VPOS, X
 B759 60 RTS

B75A STVPS1 ; ENTRY POINT FROM STHPOS *****

B75A E0 05 CPX #OBJNUM
 B75C B0 06 BCS STVPS4
 B75E A9 FB LDA #*FB
 B760 9D F9 0B STA VPOS, X

B763 STVPS8 ; ENTRY POINT FROM NEWSTR *****

B763 60 RTS

B764 STVPS4

; FALL THROUGH TO NEWSTR *****

B764 NEWSTR

; NEW STAR POSITION

B764 A9 63 LDA #99 ; RESET TO BOTTOM OF SCREEN
 B766 9D F9 0B STA VPOS, X
 B769 9D 2A 0C STA HPDS, X
 B76C E0 11 CPX #STLAST+1 ; EXPLOSION STARS
 B76E B0 F3 BCS STVPS8 ; YES
 B770 AD 0A D2 LDA RANDOM ; UPDATE Z
 B773 29 0F AND #*OF

```

B775 85 6A          STA      TEMP
B777 9D A2 0A          STA      ZPOSH, X
B77A AD 0A D2          LDA      RANDOM      ; UPDATE Y
B77D 29 0F          AND      #$0F
B77F C5 6A          CMP      TEMP
B781 90 02          BCC      NEWST3
B783 85 6A          STA      TEMP
B785                  NEWST3
B785 9D 71 0A          STA      YPOSH, X

```

```

B788 A9 0F          LDA      #$0F
B78A 9D 40 0A          STA      XPOSH, X
B78D A5 D0          LDA      DISFLG      ; UPDATE X
B78F 49 01          EOR      #$01
B791 29 01          AND      #$01
B793 9D AD 09          STA      XSIGN, X
B795 D0 11          BNE      NEWST5
B798 9D 04 0B          STA      YPOSL, X
B79B 9D 35 0B          STA      ZPOSL, X
B79E 38          SEC
B79F E5 6A          SBC      TEMP
B7A1 9D 40 0A          STA      XPOSH, X

```

```

; TRY THIS FIX, BELOW
B7A4 A9 B0          LDA      #$B0
B7A6 9D D3 0A          STA      XPOSL, X

```

```

B7A9                  NEWST5

```

```

B7A9 24 D0          BIT      DISFLG      ; SECTOR SCAN ?
B7AB 50 11          BVC      NEWST2      ; NO
B7AD AD 0A D2          LDA      RANDOM
B7B0 9D 71 0A          STA      YPOSH, X
B7B3 AD 0A D2          LDA      RANDOM
B7B6 9D 40 0A          STA      XPOSH, X
B7B9 29 01          AND      #$01
B7BB 9D AD 09          STA      XSIGN, X
B7BE                  NEWST2

```

```

B7DE                  NEWST4      ; ENTRY POINT FROM HLINES SUB *****
; DETERMINE SIGN Y, Z

```

```

B7DE AD 0A D2          LDA      RANDOM
B7C1 29 01          AND      #$01
B7C3 9D 0F 0A          STA      ZSIGN, X
B7C6 D0 0F          BNE      NEWST1
B7C8 38          SEC
B7C9 FD 35 0B          SBC      ZPOSL, X
B7CC 9D 35 0B          STA      ZPOSL, X
B7CF A9 00          LDA      #$00
B7D1 FD A2 0A          SBC      ZPOSH, X
B7D4 9D A2 0A          STA      ZPOSH, X

```

```

B7D7                  NEWST1
B7D7 AD 0A D2          LDA      RANDOM
B7DA 29 01          AND      #$01
B7DC 9D DE 09          STA      YSIGN, X
B7DF D0 0F          BNE      NEWST6
B7E1 38          SEC
B7E2 FD 04 0B          SBC      YPOSL, X
B7E5 9D 04 0B          STA      YPOSL, X
B7E8 A9 00          LDA      #$00
B7EA FD 71 0A          SBC      YPOSH, X

```

```

B7ED 9D 71 0A      STA      YPOSH.X
B7FO                NEWST6
B7FO 60             RTS

```

```

B7F1                TIMHLP
                        ;
                        ; HELPER ROUTINE FOR TIMERS
B7F1 BD C8 08      LDA      CHTRAM-1,X
B7F4 F0 0D          BEQ      TIMHP1
B7F6 BD CA 08      LDA      CHTRAM+1,X
B7F9 F0 08          BEQ      TIMHP1
B7FB BD B9 08      LDA      CHTRAM-16,X
B7FE F0 03          BEQ      TIMHP1
B800 BD D9 08      LDA      CHTRAM+16,X
B803                TIMHP1
B803 60             RTS

```

```

B804                PANDIS
                        ;
                        ; PANNEL DISPLAY ROUTINE
                        ; ONE ENTRY POINT AT PANDS6
                        ;
                        ; UPDATE VELOCITY DISPLAY
B804 A6 70          LDX      SPEED
B806 E4 71          CPX      WARP
B808 F0 08          BEQ      PANDS2
B80A 90 04          BCC      PANDS3
B80C C6 70          DEC      SPEED
B80E B0 12          BCS      PANDS1
B810                PANDS3
B810 E6 70          INC      SPEED
B812                PANDS2
B812 A5 C0          LDA      HFLAG
B814 D0 0C          BNE      PANDS1
B816 2C 93 09       BIT      DAMAGE+1
B819 10 07          BPL      PANDS1
B81B A5 71          LDA      WARP
B81D 2D 0A D2       AND      RANDOM
B820 B5 70          STA      SPEED

```

```

B822                PANDS1
                        ; ALL DONE VELOCITY DISPLAY
B822 A0 01          LDY      #DVELQC-DISCTL-1
B824 20 CD B8       JSR      TWOCM3
B827 2C 95 09       BIT      DAMAGE+3
B82A 30 30          BMI      PANDS4
                        ; COMPUTER DAMAGE
                        ;
                        ; UPDATE COORDINATES DISPLAY
B82C A9 31          LDA      #RAMNUM
B82E A0 17          LDY      #DTHETA-DISCTL
B830 20 A7 B8       JSR      TWOCOM
B833 A9 62          LDA      #RAMNUM*2
B835 A0 1D          LDY      #DPHI-DISCTL
B837 20 A7 B8       JSR      TWOCOM
B83A A9 00          LDA      #*00
                        ; DISPLAY Y COORD
                        ; DISPLAY IN THETA
                        ; UPDATE THETA
                        ; DISPLAY Z COORD
                        ; DISPLAY IN PHI
                        ; UPDATE PHI
                        ; DISPLAY X COORD

```

```

B83C A0 23      LDY      #DRHO-DISCT1      ; DISPLAY IN RHO
B83E 20 A7 B8    JSR      TWOCOM            ; UPDATE RHO
                                LOW BYTE OF RHO
B841 AD 6E 09    LDA      DRHO+2          ; PUT BLANK IN LSB IF INFINITE
B844 BD 6F 09    STA      DRHO+3
B847 C9 0A       CMP      #$0A            ; INFINITE ?
B849 B0 11       BCS      PANDS4          ; YES
B84B AE 5C 09    LDX      DCSTOR          ; WHICH OBJ TRACKING
B84E BD D3 0A    LDA      XPSL, X        ; LOW BYTE
B851 4A         LSR      A
B852 4A         LSR      A
B853 4A         LSR      A
B854 4A         LSR      A
B855 AA         TAX
B856 BD E9 0E    LDA      BCDCON, X      ; CONVERT TO BCD
B859 BD 6F 09    STA      DRHO+3        ; LSB UPDATED
B85C             PANDS4          ; ALL DONE COORD DISP
                                UPDATE ENERGY DISPLAY
                                UPDATE ENERGY DUE TO SHIELDS WARPS ATTACK COMPUTER
B85C 1B         CLC
B85D A5 7F      LDA      ENFLAG          ; LSRB OF ENERGY, DEC ENERGY WHEN CARRY
B85F 65 7D      ADC      SHENER          ; DRAIN FROM SHIELDS
B861 65 80      ADC      WPENER          ; DRAIN FROM WARP
B863 65 7E      ADC      ATENER          ; DRAIN FROM ATTACK COMPUTER
B865 69 01      ADC      #$01            ; LIFE SUPPORT
B867 C5 7F      CMP      ENFLAG          ; SET CARRY FLAG
B869 85 7F      STA      ENFLAG
B86B B0 39      BCS      PANDS5
                                DECREASE ENERGY
B86D A2 03      LDX      #$03            ; DECREASE BIT 3 OF ENERGY
B86F             PANDS6          ; ENTRY POINT TO DECREASE ENERGY *****
B86F 24 64      BIT      ATTRACT          ; GAME OVER ?
B871 70 33      BVS      PANDS5          ; YES
                                X MUST BE DEFINED = BIT TO DECREASE FROM
B873 DE 55 09    DEC      DENERG, X
B876 BD 55 09    LDA      DENERG, X
B879 C9 80      CMP      #$80            ; CHECK IF BORROW
B87B B0 29      BCS      PANDS5          ; NO BORROW
B87D A9 89      LDA      #$89
B87F 9D 55 09    STA      DENERG, X
B882 E0 02      CPX      #$02
B884 D0 08      BNE      PANDS7
B886 A5 CB      LDA      RATING
B888 D0 02      BNE      PANDS8
B88A C6 CC      DEC      RATING+1
B88C             PANDS8
B88C C6 CB      DEC      RATING
B88E             PANDS7
B88E CA         DEX
B88F 10 DE      BPL      PANDS6          ; NEXT DIGIT
                                OUT OF ENERGY !!
                                ; KEY F
B891 A2 0A      LDX      #$0A
B893 BA         TXA
B894 A0 03      LDY      #$03
B896             PAND10
B896 99 55 09    STA      DENERG+0, Y
B899 88         DEY
B89A 10 FA      BPL      PAND10
B89C 20 45 B0    JSR      KEYS15
B89F A0 31      LDY      #SENOUT-SENTAB

```



```

BBA1 A2 04      LDX    #04
BBA3 20 0A B1    JSR    CRATE
BBA6             PANDS9
BBA6             PANDS5
BBA6 60          RTS

```

```

BBA7             TWOCOM

```

TWOS OMPLEMENT AND CONVERT TO B CD HELPER ROUTINE

A=OFFSET(X,Y,Z), Y=WHERE TO STORE

```

BBA7 18          CLC
BBA8 6D 5C 09    ADC    DCSTOR      ; WHICH OBJ TRACKING
BBA8 AA          TAX
BBA8 A9 10        LDA    #010      ; + SIGN
BBAE 85 6A        STA    TEMP
BBD0 BD AD 09     LDA    XSIGN,X    ; SIGN OF OBJ
BBD3 4A           LSR    A
BBD4 BD 40 0A     LDA    XPSH,X
BBD7 B0 04        BCS    TWOCM1
                  ; NEGATIVE VALUE, TWOS COMPLEMENT
BBD9 49 FF        EOR    #FF
BBD8 C6 6A        DEC    TEMP      ; - SIGN
BBD8             TWOCM1
BBD8 AA          TAX
BBD8 A5 6A        LDA    TEMP
BBD8 99 49 09     STA    DISCTL+0,Y ; STORE SIGN

```

NO INFINITY FOR THETA OR PHI

```

BBD3 98          TYA
BBD4 29 10        AND    #010      ; THETA OR PHI ?
BBD6 F0 05        BEQ    TWOCM3    ; NO
BBD8 E0 FF        CPX    #FF      ; INFINITY ?
BBD8 D0 01        BNE    TWOCM3    ; NO
BBD8 CA          DEX
                  ; X=FE, NOT FF

```

```

BBD8             TWOCM3      ; ENTRY POINT TO LOAD ONLY *****

```

```

BBD8 BD E9 0E     LDA    BCDCON,X    ; BCD CONVERT
BBD8 AA          TAX
BBD1 29 0F        AND    #0F
BBD3 99 4B 09     STA    DISCTL+2,Y  ; LOW BYTE STOED
BBD6 8A          TXA
BBD7 4A          LSR    A
BBD8 4A          LSR    A
BBD9 4A          LSR    A
BBD8 4A          LSR    A
BBD8 99 4A 09     STA    DISCTL+1,Y  ; HIGHT BYTE STORED
BBD8 60          RTS

```

B8DF		CLINDEX	TABLES;
B8DF 00 01 02	BYTE		; COLOR INDEX TABLE USED IN OBJCOL SUBROUTINE
B8E2 03 07			0, 1, 2, 3, 7

B8E4		PHGRAF	; PHOTON GRAPHIC
B8E4 00	BYTE		0
B8E5 18 3C 7E	BYTE		\$18, \$3C, \$7E, \$7E, \$76, \$F7, \$DF, \$DF, \$FF, \$FF, \$F7, \$76, \$7E, \$7E, \$3C, \$18
B8E8 7E 76 F7			
B8EB DF DF FF			
B8EE FF F7 76			
B8F1 7E 7E 3C			
B8F4 18			
B8F5		PHGRF1	
B8F5 10 38 7C	BYTE		\$10, \$38, \$7C, \$7C, \$FE, \$DE, \$DA, \$FA, \$EE, \$EE, \$7C, \$7C, \$38, \$10
B8F8 7C FE DE			
B8FB DA FA EE			
B8FE EE 7C 7C			
B901 38 10			
B903		PHGRF2	
B903 18 3C 3C	BYTE		\$18, \$3C, \$3C, \$7E, \$6E, \$7A, \$7E, \$76, \$7E, \$3C, \$3C, \$18
B906 7E 6E 7A			
B909 7E 76 7E			
B90C 3C 3C 18			
B90F		PHGRF3	
B90F 10 38 38	BYTE		\$10, \$38, \$38, \$7C, \$74, \$7C, \$6C, \$38, \$38, \$10
B912 7C 74 7C			
B915 6C 38 38			
B918 10			
B919		PHGRF4	
B919 10 18 3C	BYTE		\$10, \$18, \$3C, \$2C, \$3C, \$3C, \$18, \$08
B91C 2C 3C 3C			
B91F 18 08			
B921		PHGRF5	
B921 10 38 38	BYTE		\$10, \$38, \$38, \$28, \$38, \$10
B924 28 38 10			

↑

B927		DKGRAF	DOCKING SHIP GRAPHIC
B927	3C 3C 24	. BYTE	\$3C, \$3C, \$24, \$3C, \$7E, \$7E, \$7E, \$5A, \$FF, \$FF, \$42, \$42, \$42, \$42, \$42, \$42
B92A	3C 7E 7E		
B92D	7E 5A FF		
B930	FF 42 42		
B933	42 42 42		
B936	42		
B937		DKGRF1	
B937	1C 1C 14	. BYTE	\$1C, \$1C, \$14, \$3E, \$3E, \$3E, \$2A, \$7F, \$7F, \$22, \$22, \$22, \$22, \$22, \$22
B93A	3E 3E 3E		
B93D	2A 7F 7F		
B940	22 22 22		
B943	22 22		
B945		DKGRF2	
B945	18 18 3C	. BYTE	\$18, \$18, \$3C, \$3C, \$3C, \$3C, \$7E, \$24, \$24, \$24, \$24
B948	3C 3C 3C		
B94B	7E 24 24		
B94E	24 24		
B950		DKGRF3	
B950	10 10 38	. BYTE	\$10, \$10, \$38, \$38, \$38, \$7C, \$28, \$28, \$28
B953	38 38 7C		
B956	28 28 28		
B959		DKGRF4	
B959	18 18 3C	. BYTE	\$18, \$18, \$3C, \$18, \$18
B95C	18 18		
B95E		DKGRF5	
B95E	10	. BYTE	\$10
B95F		GBASM6	
B95F	10 38 10	. BYTE	\$10, \$38, \$10

B962		GBASEM	
B962	18 7E FF	BYTE	\$18, \$7E, \$FF, \$FF, \$FF, \$FF, \$FF, \$E7, \$E7, \$FF, \$FF, \$FF, \$FF, \$7E, \$7E
B965	FF FF FF		
B968	FF E7 E7		
B96B	FF FF FF		
B96E	FF FF 7E		
B971	7E		
B972		GBASM1	
B972	00	BYTE	0
B973	18 3C 7E	BYTE	\$18, \$3C, \$7E, \$FF, \$FF, \$FF, \$E7, \$66, \$FF, \$FF, \$FF, \$FF, \$7E, \$7E
B976	FF FF FF		
B979	E7 66 FF		
B97C	FF FF FF		
B97F	7E 7E		
B981		GBASM2	
B981	00	BYTE	0
B982	18 3C 7E	BYTE	\$18, \$3C, \$7E, \$FF, \$FF, \$E7, \$66, \$FF, \$FF, \$FF, \$FF, \$3C
B985	FF FF E7		
B988	66 FF FF		
B98B	FF FF 3C		
B98E		GBASM3	
B98E	18 3C FF	BYTE	\$18, \$3C, \$FF, \$FF, \$E7, \$66, \$FF, \$FF, \$7E, \$3C
B991	FF E7 66		
B994	FF FF 7E		
B997	3C		
B998		GBASM4	
B998	00	BYTE	0
B999	18 3C FF	BYTE	\$18, \$3C, \$FF, \$FF, \$FF, \$3C, \$18
B99C	FF FF 3C		
B99F	18		
B9A0		GBASM5	
B9A0	18 3C FF	BYTE	\$18, \$3C, \$FF, \$3C, \$18
B9A3	3C 18		
B9A5		HWARTG	
B9A5	28 28 28	BYTE	\$28, \$28, \$28, \$28, \$EE, 0, 0, \$EE, \$28, \$28, \$28, \$28
B9AB	28 EE 00		
B9AB	00 EE 28		
B9AE	28 28 28		

B9B1	ZYGRAF	; GRAPHIC OF ZYLON SHIP BASED ON XPOS
B9B1 00	BYTE	0 BLANK
B9B2 81 81 81	BYTE	\$81, \$81, \$81, \$81, \$8D, \$FF, \$FF, \$8D, \$81, \$81, \$81, \$81
B9B5 81 8D FF		
B9B8 FF 8D 81		
B9BB 81 81 81		
B9BE	ZYGRF1	
B9BF 82 82 BA	BYTE	\$82, \$82, \$8A, \$FE, \$FE, \$8A, \$82, \$82
B9C1 FE FE BA		
B9C4 82 82		
B9C6	ZYGRF2	
B9C6 42 5A 7E	BYTE	\$42, \$5A, \$7E, \$7E, \$5A, \$42
B9C9 7E 5A 42		
B9CC	ZYGRF3	
B9CC 44 54 7C	BYTE	\$44, \$54, \$7C, \$7C, \$54, \$44
B9CF 7C 54 44		
B9D2	ZYGRF4	
B9D2 24 3C 3C	BYTE	\$24, \$3C, \$3C, \$24
B9D5 24		
B9D6	ZYGRF5	
B9D6 28 38 38	BYTE	\$28, \$38, \$38, \$28
B9D9 28		
B9DA	ZYGRF6	
B9DA 18 18	BYTE	\$18, \$18

B9DC	ZYGRF7		
B9DC 10 10		BYTE	\$10, \$10
B9DE	GBASER		
B9DE E0 FB FB		BYTE	\$E0, \$FB, \$FB, \$FE, \$57, \$FE, \$FB, \$FB, \$C0
B9E1 FE 57 FE			
B9E4 FB FB C0			
B9E7	GBASR3		
B9E7 C0 F0		BYTE	\$C0, \$F0
B9E9	GBASR1		
B9E9 C0 F0 F0		BYTE	\$C0, \$F0, \$F0, \$FC, \$BE, \$FC, \$F0, \$80, \$80
B9EC FC BE FC			
B9EF F0 80 80			
B9F2	GBASR2		
B9F2 C0 C0 F0		BYTE	\$C0, \$C0, \$F0, \$BC, \$F0, \$C0
B9F5 BC F0 C0			

B9F8	GBASEL		
B9F8 07 1F 1F		BYTE	7, \$1F, \$1F, \$7F, \$EA, \$7F, \$1F, \$1F, \$3
B9FB 7F EA 7F			
B9FE 1F 1F 03			
BA01	GBASL3		
BA01 03 0F		BYTE	3, \$F
BA03	GBASL1		
BA03 03 0F 0F		BYTE	3, \$F, \$F, \$3F, \$7D, \$3F, \$F, 1, 1
BA06 3F 7D 3F			
BA09 0F 01 01			
BA0C	GBASL2		
BA0C 03 03 0F		BYTE	3, 3, \$F, \$3D, \$F, 3
BA0F 3D 0F 03			

BA12		ROGRAF	
BA12	18 3C 7E	BYTE	\$18, \$3C, \$7E, \$DB, \$C3, \$81, \$81, \$81
BA15	7E DB C3		
BA18	81 81 81		
BA1B		ROGRF1	
BA1B	10 38 7C	BYTE	\$10, \$38, \$7C, \$D6, \$C6, \$82, \$82
BA1E	7C D6 C6		
BA21	82 82		
BA23		ROGRF2	
BA23	18 3C 3C	BYTE	\$18, \$3C, \$3C, \$66, \$66, \$42, \$42
BA26	66 66 42		
BA29	42		
BA2A		ROGRF3	
BA2A	10 38 38	BYTE	\$10, \$38, \$38, \$6C, \$44, \$44
BA2D	6C 44 44		
BA30		ROGRF4	
BA30	18 3C 24	BYTE	\$18, \$3C, \$24, \$24
BA33	24		

BA34
BA34 10 3B 2B ROGRF5
BYTE \$10, \$3B, \$2B

BA37
BA37 1B 3C 7E KLGRF
BA3A FF 1B 1B BYTE \$1B, \$3C, \$7E, \$FF, \$1B, \$1B, \$FF, \$7E, \$3C, \$1B
BA3D FF 7E 3C
BA40 1B

BA41
BA41 10 3B 7C KLGRF1
BA44 FE 3B 3B BYTE \$10, \$3B, \$7C, \$FE, \$3B, \$3B, \$FE, \$7C, \$3B, \$10
BA47 FE 7C 3B

BA4A 10
BA4B KLGRF2
BA4B 1B 3C 7E BYTE \$1B, \$3C, \$7E, \$1B, \$7E, \$3C, \$1B
BA4E 1B 7E 3C
BA51 1B

BA52
BA52 10 3B 7C KLGRF3
BA55 10 7C 3B BYTE \$10, \$3B, \$7C, \$10, \$7C, \$3B, \$10
BA5B 10

BA59
BA59 1B 3C 1B KLGRF4
BA5C 3C 1B BYTE \$1B, \$3C, \$1B, \$3C, \$1B

BA5E
BA5E 10 3B 3B KLGRF5
BA61 10 BYTE \$10, \$3B, \$3B, \$10

BA62 LISTAB ; DISPLAY LIST TABLE LDISP

BA62 8D 00 46	SHIP ALIVE	BYTE	\$8D, 0, \$46
BA65 49 09		WORD	DISCTL
BA67 20 06 00		BYTE	\$20, 6, 0
BA6A	LISTB2		; GAL CHT
BA6A 01		BYTE	1
BA6B 2E A1		WORD	GLDISP
BA6D	LISTB3		; SECT SCAN
BA6D 00 00 46		BYTE	0, 0, \$46
BA70 FB A0		WORD	SESCAN
BA72 4D		BYTE	\$4D
BA73 C8 10		WORD	MEMMAP+200
BA75	LISTB4		; BACK VIEW
BA75 00 00 46		BYTE	0, 0, \$46
BA7B 09 A1		WORD	BACKUP
BA7A 4D		BYTE	\$4D
BA7B C8 10		WORD	MEMMAP+200
BA7D	LISTB5		; FRONT VIEW
BA7D 4D		BYTE	\$4D
BA7E 00 10		WORD	MEMMAP
BAB0 0D 0D 0D		BYTE	\$0D, \$0D, \$0D, \$0D
BAB3 0D 0D			
BAB5	LISTB6		; MESSAGE ON
BAB5 30 46		BYTE	\$30, \$46
BAB7 1F 0D		WORD	MESSAGE
BAB9 4D		BYTE	\$4D
BABA AB 12		WORD	MEMMAP+680

BABC	DISDIS		; FOR KEYSRV ; DISPLAY LIST POINTERS
BABC 1B 13 0B		BYTE	LISTB5-LISTAB, LISTB4-LISTAB, LISTB3-LISTAB, LISTB2-LISTAB
BABF 0B			

BA90	BRTABL		; BRIGHTNESS SELECT TABLE
BA90 FF FF FF		BYTE	BRT, BRT, BRT, BRT
BA93 FF			
BA94 AA FF AA		BYTE	MED, BRT, MED, BRT
BA97 FF			
BA98 AA AA AA		BYTE	MED, MED, MED, BRT
BA9B FF			
BA9C AA AA AA		BYTE	MED, MED, MED, MED
BA9F AA			
BAA0 AA AA AA		BYTE	MED, MED, MED, DIM
BAA3 55			
BAA4 55 AA 55		BYTE	DIM, MED, DIM, MED
BAA7 AA			
BAA8 55 55 55		BYTE	DIM, DIM, DIM, MED
BAAB AA			
BAAc 55 55 55		BYTE	DIM, DIM, DIM, DIM
BAAF 55			

BAB0	MASK		; MASK FOR RAM MAP BYTE DUE TO HPOS
BAB0 C0 30 0C		BYTE	\$C0, \$30, \$0C, \$03
BAB3 03			

BA34

WARP TB

; SELECT WARP ACCEL FROM KEY 0-9

BYTE

0, \$01, \$02, \$04, \$08, \$10, \$20, \$40, \$60, \$70

BABE

CODCON

```

; USED IN KEYSRV SUBROUTINE FOR KEY CONVERT

```

BYTE

\$F2, \$DF, \$DE, \$DA, \$DB, \$DD, \$DB, \$F3, \$F5, \$F0

RAD3

WENTAB

ENERGY USED PER WARP

BYTE

0, 4, 6, 8, 10, 12, 14, 30, 45, 60

BADD ENGTAB ; ENERGY USED PER DISTANCE WARP JUMP
BADD 0A 0D 10 . BYTE 10, 13, 16, 20, 23, 50, 70, 80, 90, 120, 125, 130, 135, 140, 155, 170, 184, 200
BAE0 14 17 32
BAE3 46 50 5A
BAE6 78 7D 82
BAE9 87 8C 9B
BAEC AA B0 CB
BAEF D0 DB DF . BYTE 208, 216, 223, 232, 241, 250
BAF2 EB F1 FA

BAF5 JOYTAB ; CODE FOR EACH POSITION ON JOYSTICK
BAF5 00 01 FF . BYTE 0, \$1, \$FF, 0
BAFB 00

BAF9 INSTAB ; INSET LINES TABLE HDRAW, VDRAW, NUMPTS
BAF9 50 28 87 . BYTE \$50, \$28, \$87, \$50, \$36, \$87
BAFC 50 36 87
BAFF 77 46 1E . BYTE 119, 70, 30, 119, 86, 30, 119, 70, \$91, 148, 70, \$91
BB02 77 56 1E
BB05 77 46 91
BB08 94 46 91
BB0B 78 4E 06 . BYTE 120, 78, 6, 126, 75, 15, 126, 81, 15, 141, 78, 7
BB0E 7E 4B 0F
BB11 7E 51 0F
BB14 8D 4E 07
BB17 85 47 84 . BYTE 133, 71, \$84, 126, 76, \$85, 140, 76, \$85, 133, 82, \$84
BB1A 7E 4C 85
BB1D 8C 4C 85
BB20 85 52 84

```

BB2A          INSTB2          , SECTOR SCAN SHIP
BB2A 4E 35 82      . BYTE    $4E, $35, $82, $4F, $34, $82, $50, $32, $85, $51, $34, $82, $52, $35, $82
BB2D 4F 34 82
BB30 50 32 85
BB33 51 34 82
BB36 52 35 82
BB39 FE          . BYTE    $FE          , ALL DONE

```

BB3A				YINIT		HLINES
BB3A	04	04	03		BYTE	4, 4, 3, 2
BB3D	02					
BB3E				ZINIT		HLINES
BB3E	02	03	04		BYTE	2, 3, 4, 4
BB41	04					

```

↑
BB42          STINIT      ; STATUS INIT TABLE (LDTABS)
BB42 12 0B 00      BYTE   1B, 11, 0, 0, 10, $55, $4B, $40, $40, 10, $8D, $8B, $89, $89, $89, $89
BB45 00 0A 55
BB48 4B 40 40
BB4D 0A 8D 8B
BB4E 89 89 89
BB51 89
BB52 0A 16 0B      BYTE   10, $16, 11, 0
BB55 00
BB56 0A      BYTE   10
BB57 14 0B 0F      BYTE   $14, $0B, $0F, 0, 0, 10, $51, $4B, $0F, 0, 0, 10, $93, $8B, $0F, 0, 0, 0
BB5A 00 00 0A
BB5D 51 4B 0F
BB60 00 00 0A
BB63 93 8B 0F
BB66 00 00 00
BB69 0A      BYTE   10
BB6A 37 21 32      BYTE   $37, $21, $32, $30, 0, $25, $2E, $25, $32, $27, $39, $1A, 0, 0, 0
BB6D 30 00 25
BB70 2E 25 32
BB73 27 39 1A
BB76 00 00 00
BB79 10 00 00      BYTE   $10, 0, 0, 0, 0
BB7C 00 00
BB7E B4 A1 B2      BYTE   $B4, $A1, $B2, $A7, $A5, $B4, $B3, $9A, 0, 0
BB81 A7 A5 B4
BB84 B3 9A 00
BB87 00
BB88 24 23 1A      BYTE   $24, $23, $1A, $30, $25, $33, $23, $2C, $32
BB8B 30 25 33
BB8E 23 2C 32
BB91 00      BYTE   0
BB92 F3 F4 E1      BYTE   $F3, $F4, $E1, $F2, 0, $E4, $E1, $F4, $E5, $DA, $D0, $D0, $CE, $D0
BB95 F2 00 E4
BB98 E1 F4 E5
BB9B DA D0 D0
BB9E CE D0
BBA0 D0 00 00      BYTE   $D0, 0, 0, 0, 0, 0
BBA3 00 00 00

BBA6          CHRTAB      ; TABLE FOR LDTABS ROUTINE
BBA6 CF 04 03      BYTE   $CF, 4, 3, 2
BBA9 02

```

		SENTAB		TABLE OF SENTENCES	
BBAA					
BBAA 00			BYTE	0	; BUFFER
BBAB		SENACN			; ATTACK COMPUTER ON
BBAB 05 06 42			BYTE	5, 6, \$42	
BBAE		SENACF			; ATTACK COMPUTER OFF
BBAE 05 06 43			BYTE	5, 6, \$43	
BBB1		SENSON			; SHIELDS ON
BBB1 04 42			BYTE	4, \$42	
BBB3		SENSOF			; SHIELDS OFF
BBB3 04 43			BYTE	4, \$43	
BBB5		SENCTN			; COMPUTER TRACKING ON
BBB5 06 07 42			BYTE	6, 7, \$42	
BBB8		SENCTF			; COMPUTER TRACKING OFF
BBB8 07 43			BYTE	7, \$43	
BBBA		SENWHT			; WHAT?
BBBA 48			BYTE	\$48	
BBBB		SENHYP			; HYPERWARP ENGAGED
BBBB 09 4A			BYTE	9, \$4A	
BBBB		SENSUR			
BBBB 08 CD			BYTE	11, \$CD	; STARBASE SURROUNDED
BBBF		SENDES			
BBBF 08 CC			BYTE	11, \$CC	; STARBASE DESTROYED
BBC1		SENHWA			; HYPERWARP ABORTE
BBC1 09 4E			BYTE	9, \$4E	
BBC3		SENHWC			; HYPERWARP COMPLETE
BBC3 09 4F			BYTE	9, \$4F	
BBC5		SENHSP			; HYPERSPACE
BBC5 D0			BYTE	\$D0	
BBC6		SENORB			; ORBIT ESTABLISHED
BBC6 11 92 56			BYTE	17, \$92, \$56	
BBC9		SENDKA			; DOCKING ABORTED
BBC9 13 4E			BYTE	19, \$4E	
BBCB		SENETC			; ENERGY TRANSFER COMPLETE
BBCB 15 4F			BYTE	21, \$4F	
BBCD		SENDST			; YOU ARE DESTROYED
BBCD 88 97 99			BYTE	\$88, \$97, \$99, \$98, \$8C, \$9D, 30, \$9F, \$FD, 37, \$FC, \$78	
BBD0					
BBD0 98 8C 9D					
BBD3					
BBD3 1E 9F FD					
BBD6					
BBD6 25 FC 78					
BBD9		SENATA			; TITLE
BBD9 9B 60			BYTE	\$9B, \$60	

↑
BDBB
BDBB BB 97 98
BBDE 1A 8E 1C
BBE1 94 24 9F
BBE4 FD 25 FC
BBE7 A7 68
BBE9
SENWIN ; YOU WIN
BBE9 BB 97 98 . BYTE \$BB, \$97, \$98, 26, \$8E, 28, \$94, 36, \$9F, \$FD, 37, \$FC, \$A7, \$68
BBEC 1A 8F 24
BBEF 9F FD 25
BBF2 FC 66
BBF4
SENNOV ; NOVICE MISSION
BBF4 2C 5A . BYTE 44, \$5A
BBF6
SENPIL ; PILOT MISSION
BBF6 2E 5A . BYTE 46, \$5A
BBF8
SENWAR ; WARRIOR MISSION
BBF8 31 5A . BYTE 49, \$5A

BBFA	SENCOM	; COMMANDER MISSION
BBFA 33 5A	. BYTE	51, \$5A
BBFC	SENDMC	; DAMAGE CONTROL
BBFC 88 34 76	. BYTE	\$88, 52, \$76
BBFF	SENPDN	; PHOTONS DAMAGED
BBFF 37 B5 78	. BYTE	55, \$B5, \$78
BC02	SENPD5	; PHOTONS DESTROYED
BC02 37 BC 78	. BYTE	55, \$BC, \$78
BC05	SENEDM	; ENGINES DAMAGED
BC05 23 B5 78	. BYTE	35, \$B5, \$78
BC08	SENED5	; ENGINES DESTROYED
BC08 23 BC 78	. BYTE	35, \$BC, \$78
BC0B	SENSDM	; SHIELDS DAMAGED
BC0B 04 B5 78	. BYTE	4, \$B5, \$78
BC0E	SENSDS	; SHIELDS DESTROYED
BC0E 04 BC 78	. BYTE	4, \$BC, \$78
BC11	SENCDN	; COMPUTER DAMAGED
BC11 06 B5 78	. BYTE	6, \$B5, \$78
BC14	SENCD5	; COMPUER DESTROYED
BC14 06 BC 78	. BYTE	6, \$BC, \$78
BC17	SENTDM	; SECTOR SCAN DAMAGED
BC17 A2 75	. BYTE	\$A2, \$75
BC19	SENTDS	; SECTOR SCAN DESTROYED
BC19 A2 4C	. BYTE	\$A2, \$4C
BC1B	SENMDN	; COMMUNICATIONS DAMAGED
BC1B A1 75	. BYTE	\$A1, \$75
BC1D	SENMD5	; COMMUNICATIONS DESTROYED
BC1D A1 4C	. BYTE	\$A1, \$4C
BC1F	SENRED	; RED ALERT
BC1F C1	. BYTE	\$C1
BC20	SENABR	; MISSION ABORTED KEY
BC20 B8 97 98	. BYTE	\$B8, \$97, \$98, 26, \$8E, 36, \$9F, \$FD, 37, \$FC, \$66
BC23 1A 8E 24		
BC26 9F FD 25		
BC29 FC 66		

BC2B
 BC2B A0 20 20
 BC2E 20 20 52
 BC31 45 44 20
 BC34 41 4C 45
 BC37 52 54
 BC39 CF 4E
 BC3B CF 46 46
 BC3F D3 4B 49
 BC41 45 4C 44
 BC44 53
 BC45 C1 54 54
 BC4B 41 43 4B
 BC4B C3 4F 4D
 BC4E 50 55 54
 BC51 45 52
 BC53 D4 52 41
 BC56 43 4B 49
 BC59 4E 47
 BC5B D7 48 41
 BC5E 54 53 20
 BC61 57 52 4F
 BC64 4E 47 3F
 BC67 C8 59 50
 BC6A 45 52 57
 BC6D 41 52 50
 BC70 C5 4E 47
 BC73 41 47 45
 BC76 44

WORDTAB

TABLE OF WORDS

BYTE \$A0, "RED ALERT"

BYTE \$CF, "N"

BYTE \$CF, "FF"

BYTE \$D3, "FIELDS"

BYTE \$C1, "TTACK"

BYTE \$C3, "OMPUTER"

BYTE \$D4, "RACKING"

BYTE \$D7, "HATS WRONG?"

BYTE \$CB, "YPERWARP"

BYTE \$C5, "NGAGED"

BC77 D3 54 41	BYTE	\$D3, "TARBASE"
BC7A 52 42 41		
BC7D 53 45		
BC7F C4 45 53	BYTE	\$C4, "ESTROYED"
BC82 54 52 4F		
BC85 59 45 44		
BC88 D3 55 52	BYTE	\$D3, "URROUNDED"
BC8B 52 4F 55		
BC8E 4E 44 45		
BC91 44		
BC92 C1 42 4F	BYTE	\$C1, "BORTED"
BC95 52 54 45		
BC98 44		
BC99 C3 4F 4D	BYTE	\$C3, "OMplete"
BC9C 50 4C 45		
BC9F 54 45		
BCA1 C8 59 50	BYTE	\$C8, "YPERSPACE"
BCA4 45 52 53		
BCA7 50 41 43		
BCAA 45		
BCAB CF 52 42	BYTE	\$CF, "RBIT"
BCAE 49 54		
BCB0 C5 53 54	BYTE	\$C5, "STABLISHED"
BCB3 41 42 4C		
BCB6 49 53 48		
BCB9 45 44		
BCBB C4 4F 43	BYTE	\$C4, "OCKING"
BCBE 4B 49 4E		
BCC1 47		
BCC2 C5 4E 45	BYTE	\$C5, "NERGY"
BCC5 52 47 59		
BCC8 D4 52 41	BYTE	\$D4, "RANSFER"
BCCB 4E 53 46		
BCEE 45 52		
BCD0 D3 54 41	BYTE	\$D3, "TANDBY"
BCD3 4E 44 42		
BCD6 59		
BCD7 D3 54 41	BYTE	\$D3, "TAR FLEET TO"
BCDA 52 20 46		
BCDD 4C 45 45		
BCE0 54 20 54		
BCE3 4F		
BCE4 D3 54 41	BYTE	\$D3, "TAR CRUISER 7"
BCE7 52 20 43		
BCEA 52 55 49		
BCED 53 45 52		
BCF0 20 37		

BCF2 C1 4C 4C	BYTE	\$C1, "LL UNITS"
BCF5 30 55 4E		
BCF8 49 54 53		
BCFB CD 49 53	BYTE	\$CD, "MISSION"
BCFE 53 49 4F		
BD01 4E		
BD02 A0 20 20	BYTE	\$A0, " STAR RAIDERS"
BD05 20 53 54		
BD08 41 52 20		
BD0B 52 41 49		
BD0E 44 45 52		
BD11 53		
BD12 DA 45 52	BYTE	\$DA, "ERO"
BD15 4F		
BD18 C2 59 20	BYTE	\$C2, "Y ZYLON FIRE"
BD19 5A 52 4C		
BD1C 4F 4E 20		
BD1F 46 49 52		
BD22 45		
BD23 D0 4F 53	BYTE	\$D0, "OSTHUMOUS"
BD26 54 4B 55		
BD29 4D 4F 55		
BD2C 53		
BD2D D2 41 4E	BYTE	\$D2, "ANK IS:"
BD30 4B 20 49		
BD33 53 3A		
BD35 C3 4F 50	BYTE	\$C3, "OPYRIGHT ATARI 1979"
BD38 59 52 49		
BD3B 47 4B 54		
BD3E 20 41 54		
BD41 41 52 49		
BD44 20 31 39		
BD47 37 39		
BD49 D3 55 42	BYTE	\$D3, "UB-SPACE RADIO"
BD4C 2D 53 50		
BD4F 41 43 45		
BD52 20 52 41		
BD55 44 49 4F		
BD58 D3 45 43	BYTE	\$D3, "ECTOR SCAN"
BD5B 54 4F 52		
BD5E 20 53 43		
BD61 41 4E		
BD63 C5 4E 47	BYTE	\$C5, "NGINES"
BD66 49 4E 45		
BD69 53		
BD6A CE 45 57	BYTE	\$CE, "EW"
BD6D C3 4C 41	BYTE	\$C3, "LASS"
BD70 53 53		
BD72 C3 4F 4E	BYTE	\$C3, "ONGRATULATIONS"
BD75 47 52 41		
BD78 54 55 4C		
BD7B 41 54 49		
BD7E 4F 4E 53		

BDEE C3 4F 4D . BYTE \$C3, "OMMANDER"

BDF1 4D 41 4E

BDF4 44 45 52

BDF7 C4 41 4D

. BYTE \$C4, "AMAGE"

BDF4 41 47 45

BDFD C4 41 4D

. BYTE \$C4, "AMAGED"

BE00 41 47 45

BE03 44

BE04 C3 4F 4E

. BYTE \$C3, "ONTROL"

BE07 54 52 4F

BE0A 4C

BE0B D0 4B 4F

. BYTE \$D0, "HOTONS"

BE0E 54 4F 4E

BE11 53

BE12 A0

. BYTE \$A0 ; BLANK

BE13 D3 54 41

. BYTE \$D3, "TAR COMMANDER"

BE16 52 20 43

BE19 4F 4D 4D

BE1C 41 4E 44

BE1F 45 52

BE21 80

. BYTE \$80 ; END TABLE

BE22		DISTYP		CODE TO LOAD IN DISFLG
BE22 00 01 40			BYTE	0, 1, \$40, \$80
BE25 80				
BE26		TOFFMG		POINTER TO TOGGLE OFF MESSAGE
BE26 0E 09 04			BYTE	SENCTF-SENTAB, SENSOFF-SENTAB, SENACF-SENTAB
BE29		TOGTAB		BYTE TO TOGGLE RAM BYTE WITH
BE29 FF 0B 02			BYTE	\$FF, 8, 2
BE2C		TONMSG		POINTER TO TOGGLE ON MESSAGE
BE2C 0B 07 01			BYTE	SENCTN-SENTAB, SENSON-SENTAB, SENACN-SENTAB

BE2F		GPOINT		TABLE OF GRAPHIC POINTERS FOR THE OBJ (OBJCOL)
BE2F 01 11 1F			BYTE	1, PHGRF1-PHGRAF, PHGRF2-PHGRAF, PHGRF3-PHGRAF, PHGRF4-PHGRAF
BE32 2B 35				
BE34 3D 75 7A			BYTE	PHGRF5-PHGRAF, DKGRF4-PHGRAF, DKGRF5-PHGRAF
BE37 01 0D 15			BYTE	1, ZYGRF1-ZYGRAF, ZYGRF2-ZYGRAF, ZYGRF3-ZYGRAF, ZYGRF4-ZYGRAF
BE3A 1B 21				
BE3C 25 29 2B			BYTE	ZYGRF5-ZYGRAF, ZYGRF6-ZYGRAF, ZYGRF7-ZYGRAF
BE3F 2D			BYTE	GBASER-ZYGRAF
BE40 38 41 36			BYTE	GBASR1-ZYGRAF, GBASR2-ZYGRAF, GBASR3-ZYGRAF, GBASR3-ZYGRAF, 0, 0, 0
BE43 36 00 00				
BE46 00				
BE47 7E			BYTE	GBASEM-PHGRAF
BE48 8E 9D AA			BYTE	GBASM1-PHGRAF, GBASM2-PHGRAF, GBASM3-PHGRAF, GBASM4-PHGRAF
BE4B B4				
BE4C BC 7B 7A			BYTE	GBASM5-PHGRAF, GBASM6-PHGRAF, DKGRF5-PHGRAF
BE4F 47			BYTE	GBASEL-ZYGRAF
BE50 52 5B 50			BYTE	GBASL1-ZYGRAF, GBASL2-ZYGRAF, GBASL3-ZYGRAF, GBASL3-ZYGRAF, 0, 0, 0
BE53 50 00 00				
BE56 00				
BE57 43			BYTE	DKGRAF-PHGRAF
BE5B 53 61 6C			BYTE	DKGRF1-PHGRAF, DKGRF2-PHGRAF, DKGRF3-PHGRAF, DKGRF4-PHGRAF
BE5B 75				
BE5C 7A 75 7A			BYTE	DKGRF5-PHGRAF, DKGRF4-PHGRAF, DKGRF5-PHGRAF
BE5F 01 11 1F			BYTE	1, PHGRF1-PHGRAF, PHGRF2-PHGRAF, PHGRF3-PHGRAF, PHGRF4-PHGRAF
BE62 2B 35				
BE64 3D 75 7A			BYTE	PHGRF5-PHGRAF, DKGRF4-PHGRAF, DKGRF5-PHGRAF



BE67	61	. BYTE	ROGRAF-ZYGRAF
BE68	6A 72 79	. BYTE	ROGRF1-ZYGRAF, ROGRF2-ZYGRAF, ROGRF3-ZYGRAF, ROGRF4-ZYGRAF
BE6B	7F		
BE6C	83 29 2B	. BYTE	ROGRF5-ZYGRAF, ZYGRF6-ZYGRAF, ZYGRF7-ZYGRAF
BE6F	86	. BYTE	KLGRAF-ZYGRAF
BE70	90 9A A1	. BYTE	KLGRF1-ZYGRAF, KLGRF2-ZYGRAF, KLGRF3-ZYGRAF, KLGRF4-ZYGRAF
BE73	A8		
BE74	AD 29 2B	. BYTE	KLGRF5-ZYGRAF, ZYGRF6-ZYGRAF, ZYGRF7-ZYGRAF
BE77	C1 C1 C1	. BYTE	HWARTG-PHGRAF, HWARTG-PHGRAF, HWARTG-PHGRAF, HWARTG-PHGRAF
BE7A	C1		
BE7B	C1 C1 75	. BYTE	HWARTG-PHGRAF, HWARTG-PHGRAF, DKGRF4-PHGRAF, HWARTG-PHGRAF
BE7E	C1		

BE7F		NBYTAB	NUMBER OF BYTES TO STORE (OBJCOL)
BE7F	0F 0D 0B	. BYTE	15, 13, 11, 9, 7, 5, 1, 1
BE82	09 07 05		
BE85	01 01		
BE87	0B 07 05	. BYTE	11, 7, 5, 5, 3, 3, 1, 1
BE8A	05 03 03		
BE8D	01 01		
BE8F	09 0B 05	. BYTE	9, 8, 5, 2, 0, 0, 0, 0
BE92	02 00 00		
BE95	00 00		
BE97	0F 0E 0C	. BYTE	15, 14, 12, 9, 7, 4, 2, 1
BE9A	09 07 04		
BE9D	02 01		
BE9F	09 0B 05	. BYTE	9, 8, 5, 2, 0, 0, 0, 0
BEA2	02 00 00		
BEA5	00 00		
BEA7	0F 0D 0A	. BYTE	15, 13, 10, 8, 4, 3, 1, 1
BEAA	0B 04 03		
BEAD	01 01		
BEAF	0F 0D 0B	. BYTE	15, 13, 11, 9, 7, 5, 1, 1
BEB2	09 07 05		
BEB5	01 01		
BEB7	0B 07 06	. BYTE	8, 7, 6, 5, 3, 2, 1, 1
BEBA	05 03 02		
BEBD	01 01		
BEBF	09 09 06	. BYTE	9, 9, 6, 6, 4, 3, 1, 1
BEC2	06 04 03		
BEC5	01 01		
BEC7	0B 0B 0B	. BYTE	11, 11, 11, 11, 11, 11, 1, 11
BECA	0B 0B 0B		
BECD	01 0B		

↑
 BECF TRKTAB ; KEY FOR SWITCHING DISPLAY, ASERVE
 BECF F8 FF . BYTE \$F8, \$FF
 BED1 CHTABL ; FOR LOCAL CODES FOR CHTDIS
 BED1 0C 1E 1E . BYTE \$0C, \$1E, \$1E, \$1D, \$1C, \$1B
 BED4 1D 1C 1B

BED7 STERTB ; USED IN HWARP STEERING, OBJCOL
 BED7 9F BF DF . BYTE \$9F, \$BF, \$DF, \$FF
 BEDA FF

BEDB BHORTB ; STAR BASE HORIZ OFFSET TABLE
 BEDB F8 0B . BYTE \$F8, 0B

BEDD DIFTAB ; RATING/DIFFICULTY TABLE
 BEDD 50 4C 3C . BYTE 80, 76, 60, 111, 60, 60, 50, 100, 40, 50, 40, 90
 BEE0 6F 3C 3C
 BEE3 32 64 2B
 BEE6 32 2B 5A

BEE9 RANKTB ; RANK WORD VS. RATING HI NIBBLE
 BEE9 A9 AA AA . BYTE \$A9, \$AA, \$AA, \$AB, \$AB, \$AC, \$AC, \$AD, \$AD, \$AE, \$AE, \$AF, \$B0, \$B1, \$B2, \$B3
 BEEC AB AB AC
 BEEF AC AD AD
 BEF2 AE AE AF
 BEF5 B0 B1 B2
 BEF8 B3
 BEF9 B3 B9 B9 . BYTE \$B3, \$B9, \$B9

BEFC
 BEFC 95 95 95
 BEFF 94 94 94
 BF02 94 93 93
 BF05 93 92 92
 BF08 92 91
 BF0A 91 91 . BYTE \$91, \$91

BFOC
 BFOC 4A 4C 4E . MSENTB ; MISSION TYPE TABLE
 BFOF 50 . BYTE SENNOV-SENTAB, SENPIL-SENTAB, SENWAR-SENTAB, SENCOM-SENTAB
 BF10
 BF10 00 50 B4 . DPRBTB ; DAMAGE PROB BASED ON MISDIF
 BF13 FE . BYTE 0, 80, 180, \$FE
 BF14
 BF14 55 58 61 . DAMGTB ; SENTENCES FO DAMAGE (DAMCTL)
 BF17 67 . BYTE SENPDM-SENTAB, SENEDM-SENTAB, SENSDM-SENTAB, SENCQM-SENTAB
 BF18 6D 71 . DESTTB ; SENTENCES FO DESTROY (DAMCTL)
 BF1A 58 5E 64 . BYTE SENPDS-SENTAB, SENEDS-SENTAB, SENSDS-SENTAB, SENCDS-SENTAB
 BF1D 6A . BYTE SENTDS-SENTAB, SENMDS-SENTAB
 BF1E 6F 73

BF20
 NOISTB ; NOISE ROUTINE, INIT AUDTIM, AUDADD, AFREQ2, AFREQ1, ATYPE3
 ; ATYPE2, AUDEXP, PHOREP, AUDCTL, AUDF3
 FOR PHOTONS
 . BYTE \$18, \$FF, 2, 0, \$8A, \$A0, 0, 8, \$50, \$00

BF23 00 8A A0
 BF26 00 08 50
 BF29 00

BF2A
 BF2A 40 40 01 . NOITB1 ; FOR SHIELD EXPLOSION
 BF2D 03 88 AF . BYTE \$40, \$40, 1, 3, \$88, \$AF, 8, 0, \$50, 4

BF30 08 00 50
 BF33 04
 BF34 . NOITB2 ; FOR ZYLON EXPLOS
 BF34 30 40 01 . BYTE \$30, \$40, 1, 3, \$84, \$A8, 4, 0, \$50, 4
 BF37 03 84 A8
 BF3A 04 00 50
 BF3D 04

BF3E	CH4TAB	:	NOTINT,	INIT	REPPT, NPRIOR, SDURAT, NDURAT, REPSEQ, NOTSEQ
BF3E	CH4TB1	:	HYPERSPACE		
BF3E 02 02 02	. BYTE	:	2, 2, 2, 3, 12, 2		
BF41 03 0C 02					
BF44	CH4TB2	:	RED ALERT		
BF44 04 03 FF	. BYTE	:	4, 3, \$FF, \$10, 7, 4		
BF47 10 07 04					
BF4A	CH4TB3	:	KEYS		
BF4A 07 04 02	. BYTE	:	7, 4, 2, 2, 0, 7		
BF4D 02 00 07					
BF50	CH4TB4	:	DAMAGE		
BF50 08 05 FF	. BYTE	:	11, 5, \$FF, \$20, 2, 11		
BF53 20 02 0B					
BF56	CH4TB5	:	MESSAGE		
BF56 0E 06 0B	. BYTE	:	14, 6, 8, \$20, 0, 14		
BF59 20 00 0E					

BF5C	NOTTAB	:	TABL 0 NOTES, FF=RESERVED BYTE		
BF5C 10 FF	. BYTE	:	\$10, \$FF	:	TRACKING
BF5E 18 FF	. BYTE	:	\$18, \$FF	:	HYPERSPACE
BF60 40 60 FF	. BYTE	:	\$40, \$60, \$FF	:	RED ALERT
BF63 10 10 10	. BYTE	:	\$10, \$10, \$10, \$FF	:	KEYS
BF66 FF					
BF67 40 20 FF	. BYTE	:	\$40, \$20, \$FF	:	DAMAGE
BF6A 48 40 51	. BYTE	:	\$48, \$40, \$51, \$FF	:	STARFLEET MESSAGE
BF6D FF					

BF6E	ZYTARG	:	GRAPHIC OF ZYLDN TARGET
BF6E B4 B4 FC	. BYTE	:	\$B4, \$B4, \$FC, \$B4, \$B4
BF71 B4 B4			

BF73	PHOYPS	:	YPOSH FOR PHOTON
BF73 FF 01	. BYTE	:	\$FF, 1

BF75	PHPOST	:	BOUNDS IN HITZYL
BF75 0C 0C 0C	. BYTE	:	\$C, \$C, \$C, \$C, \$E, \$E, \$E, \$20
BF78 0C 0E 0E			
BF7B 0E 20			

BF7D PHPOSB ; BOUNDS IN HITZYL
 BF7D 00 00 00 BYTE 0,0,0,2,4,6,8,0C
 BF80 02 04 06
 BF83 08 0C

BF85 PHODIF ; THINK
 BF85 81 84 88 BYTE \$81,\$84,\$88,\$94
 BF88 94

BF89 ZYGIND ; THINK
 BF89 80 10 10 BYTE \$80,\$10,\$10,\$10,\$70,\$70,\$70,\$10
 BF8C 10 70 70
 BF8F 70 10

BF91 INTSEQ ; THINK
 BF91 04 04 00 BYTE 4,4,0,0,0,1,0,0
 BF94 00 00 01
 BF97 00 00

BF99 ZYWARP ; THINK
 BF99 3E 1E 10 BYTE \$3E,\$1E,\$10,8,4,2,1,0,0,\$81,\$82,\$84,\$88,\$70,\$7E,\$BE
 BF9C 08 04 02
 BF9F 01 00 00
 BFA2 81 82 84
 BFA5 88 90 9E
 BFAB BE

BFA9 CLITAB ; LDTABS
 BFA9 A6 AA AF . BYTE \$A6, \$AA, \$AF, 0, 0, \$B8, \$5A, \$FC, \$5E, \$90
 BFAC 00 00 B8
 BFAF 5A FC 5E
 BFB2 90

BFB3 JMASK ; HWARP SUB, USED FOR INITING TARG POSITIONS
 BFB3 FF FF 3F . BYTE \$FF, \$FF, \$3F, \$0F, \$3F, \$7F, \$FF, \$FF
 BFB6 0F 3F 7F
 BFB9 FF FF

BFBB JMPWHN ; TIMERS, WHEN EACH ZYLON TYPE SHOULD JUMP
 BFBB 00 FF FF . BYTE 0, \$FF, \$FF, \$C0, \$20
 BFBE C0 20

BFC0 JMPTAB ; TIMERS, JUMP VECTORS FOR ZYLONS
 BFC0 F0 EF FF . BYTE \$F0, \$EF, \$FF, 15, 16, 17, 1, \$F1, 0
 BFC3 0F 10 11
 BFC6 01 F1 00

BFC9 PHVECT ; POHELP
 BFC9 00 08 10 . BYTE 0, 8, \$10, \$18, \$28, \$30, \$38, \$40
 BFCC 18 28 30
 BFCF 38 40

BFD1 COLTAB ; OBJCOL, CHROMA FOR EACH TYPE GRAPHIC
 BFD1 50 00 20 . BYTE \$50, 0, \$20, \$20, \$20, 0, \$A0, 0, 0, \$9F
 BFD4 20 20 00
 BFD7 A0 00 00
 BFDA 9F

BFDB COLINT ; OBJCOL, INTENSITY PER XPOSH
 BFDB 0E 0E 0E . BYTE \$E, \$E, \$E, \$C, \$C, \$C, \$A, \$A, \$A, 8, 8, 6, 6, 4, 4
 BFDE 0C 0C 0C
 BFE1 0A 0A 0A
 BFE4 08 08 08
 BFE7 06 06 04
 BFEA 04

↑
BFEB PHOTB2 ; AUDIO, ATYPE3
BFEB 8A 0F 8D . BYTE \$8A, \$8F, \$8D, \$9B, \$89, \$87, \$85, \$83
BFEE 8B 09 87
BFF1 85 83
BFF3 PHOTB4 ; AUDIO, AFREQ3
BFF3 00 04 01 . BYTE 0, 4, 1, 4, 1, 4, 1, 4
BFF6 04 01 04
BFF9 01 04
BFFB PHASE5

1?
07
Blank

CARTRIDGE OPERATING CODES

BFFC 00	.*=\$BFFC		
BFFD 80	.BYTE 0		; CARTRIDGE IN FLAG
BFFE 4A A1	.BYTE \$80		; RUN CARTRIDGE IMMEDIATELY
	.WORD INIT		; START ADDR POINTER

C000 PHASE9

RAM MAP

		==280	
0280	RAMMAP		; MISC RAM STORAGE
0280	DISPLY		; DISPLAY LIST RAM
		==+128	; SEE EQUATES FOR INTERNAL LABELS
0300	PHASE2		
		==300	
0300	PGRAPH		
0300	MGRAPH		; MISSILE GRAPHICS RAM
		==+256	
0400	PGRAP0		
		==+256	
0500	PGRAP1		
		==+256	
0600	PGRAP2		
		==+256	
0700	PGRAP3		
		==+256	
0800	VCONL		; VERT CONVERT TABLE LO BYTE
		==+100	
0864	VCONH		; VERT CONVERT TABLE HI BYTE
		==+100	
		==+1	; BUFFER BYTE
08C9	CHTRAM		; CHART RAM, HOW MANY ZYLONS IN EACH QUAD
		==+128	
0949	DISCTL		; DISPLAY OF CONTRAL STATUS PANNEL
		==+2	
0948	DVELOC		; DISP OF VELOC
		==+2	
		==+3	
0950	DKILL		; DISP OF KILL
		==+2	
		==+3	
0955	DENERG		; DISPLAY OF ENERGY
		==+4	
		==+3	
095C	DCSTOR		; WHICH OBJ TRACKING
		==+1	
			NEXT LINE
		==+3	
0960	DTHETA		; DISPLAY OF THETA
		==+3	
		==+3	
0966	DPHI		; DISPLAY OF PHI
		==+3	
		==+3	
096C	DRHO		; DISPLAY OF RHO
		==+4	
		==+1	
			NEXT LINE
0971	DGALAC		; GALACTIC CHART INFO
		==+12	
097D	DWENER		; DISPLAY WARP ENERGY
		==+3	

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      ***5
      NEXT LINE
078D      DTARG      ; DISP OF TARGETS IN QUAD
      ***+8
      ***+1
      ***+4
0992      DAMAGE      ; DAMAGE CONTROL RAM, +0=PHOTONS, +1=ENGINES
      ***+6      ; +2=SHIELDS, +3=COMPUTER, +4=SECTOR SCAN
      ; +5=SUB-SPACE RADIO
      ***+1
      NEXT LINE
      ***+10
09A3      DSDATE      ; DISP OF STAR DATE
      ***+5
      ***+5
09AD      STRRAM      ; RAM FOR STARS, OBJECTS POSITIONS, ETC.
09AD      XSIGN      ; SIGN OF XPOS
      ***+RAMNUM
09DE      YSIGN      ;
      ***+RAMNUM
0A0F      ZSIGN      ;
      ***+RAMNUM
0A40      XPOSH      ; XPOS IN SPACE HI BYTE
      ***+RAMNUM
0A71      YPOSH      ;
      ***+RAMNUM
0AA2      ZPOSH      ;
      ***+RAMNUM
0AD3      XPOSL      ; XPOS IN SPACE LO BYTE
      ***+RAMNUM
0B04      YPOSL      ;
      ***+RAMNUM
0B35      ZPOSL      ;
      ***+RAMNUM
0B66      XINCRE      ; OBJECTS X DIRECTION VELOCITY
      ***+RAMNUM
0B97      YINCRE      ;
      ***+RAMNUM
0BC8      ZINCRE      ;
      ***+RAMNUM
0BF9      VPOS      ; VERT POS ON SCREEN
      ***+RAMNUM
0C2A      HPOS      ; HORIZ POS ON SCREEN
      ***+RAMNUM
0C5B      OLDVER      ; OLD VERT POSIT
      ***+RAMNUM
0CBC      GINDEX      ; TYPE OF GRAPHIC,          OBJECT
0CBC      OLDHOR      ; OLD HORIZ POSIT          STARS
      ***+RAMNUM
0CBD      OLDNUM      ; PREVIOUS NUMBER OF BYTES STORED          OBJECT
0CBD      OLDBYT      ; OLD BYTE IN RAM MAP          STARS
      ***+RAMNUM
0CEE      NUMBYT      ; HOW MAY BYTES TO STORE          OBJECT
0CEE      STRBYT      ; THE BYTE TO STORE          STARS
      ***+RAMNUM
0D1F      MESSAGE      ; DISPLAY OF MESSAGE RAM
      ***+20
      ***+2      ; BUFFER ZONE
0D35      CHTDIS      ; CHAR GRAPHICS PNTR FO CALCHT

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***180

0DE9 PTAB ; XBO SCALER TABLE

***256

0FE7 BCDCON ; BINARY TO BCD TABLE

***256

0FE9 PHASE7

*=\$1000

1000 MEMMAP ; SCREEN MAP RAM

***4096

2000 MEMEND

2000 PHASE3

END PROGRAM

END

SYMBOL TABLE

AFREQ1	00DE	AFREQ2	00DF	ALLPOT	D20B	ALPHA	E000
ANTIC	B400	ASERV1	A600	ASERV2	A635	ASERV3	A61B
ASERV4	A50C	ATENER	007E	ATTRACT	0064	ATTARG	00BF
ATYPE2	00DC	ATYPE3	00DD	AUD10	B32B	AUD11	B2F3
AUD12	B349	AUDADD	00E0	AUDC1	D201	AUDC2	D203
AUDC3	D205	AUDC4	D207	AUDCTL	D208	AUDEXP	00DB
AUDF1	D200	AUDF2	D202	AUDF3	D204	AUDF4	D206
AUDIO	B2AB	AUDIO1	B2E6	AUDIO2	B2C1	AUDIO3	B2E1
AUDIO4	B337	AUDIO5	B357	AUDIO6	B369	AUDIO7	B39F
AUDIO8	B397	AUDTIM	00E1	BACKUP	A109	BASFLG	007B
BCDCON	0EE9	BHORTB	BEDB	BIGEXP	00E3	BINNMI	0077
BINTIM	0076	BOUND1	A422	BOUND3	A42B	BOUND4	A43F
BOUND5	A43C	BRT	00FF	BRTABL	BA90	BRTBLU	00AF
BRTRED	004F	BSEGTM	0075	BSER11	AD70	BSER12	ADCA
BSER13	AD12	BSER14	AD35	BSER15	AD6C	BSER20	ADD7
BSERV1	AD26	BSERV3	AD71	BSERV4	AD82	BSERV5	ADB9
BSERV7	ADBB	BSERV8	AD61	BSERV9	ACF3	BSERVE	ACE6
BSTRAF	00B8	C0	A000	C1	A00B	C2	A010
C3	A01B	C4	A020	C5	A02B	C6	A030
C7	A03B	C8	A040	C9	A04B	CALC14	A4AD
CALCV1	A453	CALCV3	A49A	CALCV4	A4A4	CALCV5	A4A7
CALCV8	A473	CALCV9	A47D	CBLK	A050	CC	A0BB
CDQT	A0D0	CE	A06B	CEQ	A05B	CQCBLK	A060
CGRAPH	A000	CH4TAB	BF3E	CH4TB1	BF3E	CH4TB2	BF44
CH4TB3	BF4A	CH4TB4	BF50	CH4TB5	BF56	CHACTL	D401
CHBASE	D409	CHLINE	A0C0	CHRTAB	BBA6	CHTABL	BED1
CHTDIS	0D35	CHTRAM	0BC9	CINF	A070	CK	A0AB
CLASTB	BEFC	CLINDX	B8DF	CLITAB	BFA9	CLRMAB	AE0D
CLRMP1	AE0F	CLRMP2	AE1A	CLROB1	A26A	CLROB2	A277
CLROB3	A284	CLROB4	A291	CLROB5	A29E	CLRSR1	A201
CLRSR2	A21F	CMINUS	A07B	CNSTAR	007A	CODCON	BABE
COLBK	D01A	COLINT	BFDB	COLPFO	D016	COLPF1	D017
COLPF2	D01B	COLPF3	D019	COLPM0	D012	COLPM1	D013
COLPM2	D014	COLPM3	D015	COLRAM	00EE	COLTAB	BFD1
CONSOL	D01F	CONSR2	A6C2	CONSR3	A6B7	CPHI	A0BB
CPLUS	A0B0	CRATE	B10A	CRATE1	B121	CRATE2	B14A
CRATE3	B161	CRATE4	B15D	CRATE5	B15A	CRHQ	A09B
CSBASE	A0DB	CSE10	B173	CSE11	B1CB	CSE1V1	B16B
CSE1V2	B1BE	CSE1V3	B1D3	CSE1V4	B1E0	CSE1V5	B200
CSE1V6	B1FE	CSE1V7	B212	CSE1V8	B1A7	CSE1V9	B16A
CSE1VE	B162	CT	A0B0	CTHETA	A0A0	CTIA	D000
CV	A090	CVLINE	A0CB	CZY1	A0EB	CZY2	A0E0
CZY3	A0F0	DAMAGE	0992	DAMCT1	AF3C	DAMCT2	AEF7
DAMCT3	AF1E	DAMCT4	AF32	DAMCT5	AF10	DAMCT6	AF19
DAMCTL	AEE1	DAMGTB	BF14	DBLUE	00A0	DCSTOR	095C
DENERG	0955	DESTTB	BF1A	DGALAC	0971	DIFTAB	BEDD
DIM	0055	DIMBLU	0090	DIMRED	0042	DISCTL	0949
DISDIS	BABC	DISFLG	00D0	DISNM1	A72B	DISNM2	A730
DISNM1	A71B	DISPL1	02B2	DISPL2	02BF	DISPL3	02DF
DISPLY	02B0	DISTOP	007C	DISTYP	BE22	DIVID1	AA40
DIVID2	AA52	DIVID3	AA66	DIVID4	AA6F	DIVID5	AA7B
DIVIDE	AA21	DKGRAF	B927	DKGRF1	B937	DKGRF2	B945
DKGRF3	B950	DKGRF4	B959	DKGRF5	B95E	DKILL	0950
DLISTH	D403	DLISTL	D402	DMACTL	D400	DPHI	0966
DPRBTB	BF10	DRAWER	A7B2	DRAWR1	A7BE	DRAWR2	A7BE
DRAWR3	A7B4	DRAWR4	A7B8	DRAWR5	A7BA	DRHO	096C
DRKRED	0060	DSDATE	09A3	DTARG	09BD	DTHETA	0960
DVELOQ	094B	DWENER	097D	ENDCLS	00CE	ENDRAT	00CD
ENFLAG	007F	ENGTAB	BADD	ETIMER	0073	EXHELP	ACAF

EXHLP1	ACC1	EXHLP2	ACE5	EXPDEL	00E2	EXPLOS	AC6B
EXPLS1	AC73	EXPNUM	0020	GALCHT	A11A	GBASEL	B9FB
GBASEM	B962	GBASER	B9DE	GBASL1	BA03	GBASL2	BA0C
GBASL3	BA01	GBASM1	B972	GBASM2	B981	GBASM3	B98E
GBASM4	B998	GBASM5	B9A0	GBASM6	B95F	GBASR1	B9E9
GBASR2	B9F2	GBASR3	B9E7	GHPDS	008D	GINDEX	0C8C
GLD1SP	A12E	GPOINT	BE2F	GRACLT	D01D	GRAFM	D011
GRAFP0	D00D	GRAFP1	D00E	GRAFP2	D00F	GRAFP3	D010
GRAPH	00E4	GVPOS	008C	HABOR1	A98D	HABOR2	A987
HABOR3	A9A6	HABORT	A980	HDRAW	00A6	HFLAG	00C0
HISPED	00C1	HITCLR	D01E	HITME	008A	HITSH1	A69B
HITSH2	A6B7	HITZ10	A6E7	HITZ11	AF94	HITZY1	AF43
HITZY2	AF3F	HITZY3	AF6F	HITZY4	AF6C	HITZY5	AFEC
HITZY6	AFF3	HITZY7	AFFD	HITZY8	AF64	HITZY9	AF58
HITZYL	AF3D	HLINE1	AA20	HLINE2	A9C6	HLINE3	AA1A
HLINE4	A9E5	HLINES	A9B4	HMAX	00A0	HOBCEM	007D
HQFLOW	0050	HORCHT	003D	HORJQY	00C8	HPNTR	00C3
HPOS	0C2A	HPOSM0	D004	HPOSM1	D005	HPOSM2	D006
HPOSM3	D007	HPOSP0	D000	HPOSP1	D001	HPOSP2	D002
HPOSP3	D003	HSCROL	D404	HSER10	A91E	HSERV1	A97F
HSERV2	A96F	HSERV3	A947	HSERV4	A900	HSERV5	A901
HSERV6	A8AC	HSERV7	A8EC	HSERV8	A915	HSERV9	A8E8
HSERVE	A89B	HSTCEN	0050	HSTEER	00C4	HTARGET	00A0
HTIMER	00C2	HWARTG	B9A5	HVHPOS	008F	HYPENG	0091
HYPQAD	0092	HYVPOS	008E	ICON1	1D40	ICON2	1BFE
INCKL1	AFD5	INCKL2	A6E7	INIT	A14A	INIT1	A15E
INIT2	A165	INIT3	A15A	INIT4	A15C	INIT5	A172
INSET	1B36	INSTAB	BAF9	INSTB1	BB23	INSTB2	BB2A
INTSEQ	BF91	IRGEN	D20E	IRGMSK	0040	IRGST	D20E
IRQVEC	A751	JMASK	BFB3	JMPMSK	00C7	JMPOUT	009F
JMPPTS	0096	JMPTAB	BFC0	JMPTIM	007B	JMPWHN	BFB8
JOYTAB	BAF5	KBCODE	D209	KEYS10	B096	KEYS13	B0ED
KEYS14	B0FB	KEYS15	B045	KEYS18	B082	KEYS20	B02B
KEYS23	B036	KEYS24	B0E6	KEYS27	B0FC	KEYS28	B106
KEYSR1	B011	KEYSR2	B020	KEYSR3	B040	KEYSR4	B041
KEYSR5	B060	KEYSR6	B056	KEYSR7	B07B	KEYSR8	B099
KEYSR9	B073	KEYSRV	AFFE	KILBAS	0093	KILOCH	0094
KILOCV	0095	KLGRAF	BA37	KLGRF1	BA41	KLGRF2	BA4B
KLGRF3	BA52	KLGRF4	BA59	KLGRF5	BA5E	LDGAL1	B4BD
LDGAL2	B4C6	LDGALT	B4B9	LDINS1	A77B	LDINS2	A7B1
LDINS4	A77A	LDINS6	A765	LDINST	A76F	LDISP	ADF1
LDISP1	AE03	LDISP2	ADFB	LDISP3	ADF4	LDMES1	B22E
LDMES2	B21E	LDMES3	B234	LDMES4	B23A	LDMES5	B249
LDMES6	B25F	LDMES7	B276	LDMES8	B27C	LDMES9	B286
LDMES10	B223	LDMS10	B2AB	LDMS11	B2A2	LDMS12	B268
LDMS14	B21F	LDTAB1	B3EE	LDTAB2	B41B	LDTAB3	B441
LDTAB4	B44C	LDTAB5	B488	LDTAB6	B492	LDTAB7	B47C
LDTAB8	B3CA	LDTAB9	B3BA	LDTB10	B3BC	LISTAB	BA62
LISTB2	BA6A	LISTB3	BA6D	LISTB4	BA75	LISTB5	BA7D
LISTB6	BA85	LOKFLG	00A3	LOKLQC	0086	LOKTAR	0089
LOKWAT	0088	LTBLUE	0092	MOPF	D000	MOPL	D008
M1PF	D001	M1PL	D009	M2PF	D002	M2PL	D00A
M3PF	D003	M3PL	D00B	MAIN	A1F3	MAIN1	A3BB
MAIN3	A69B	MAIN4	A5D0	MASK	BAB0	MED	00AA
MEMEND	2000	MEMMAP	1000	MESSAGE	0D1F	MESTIM	00CF
MGRAPH	0300	MISDIF	0062	MOTIN1	A3E4	MOTIN2	A3EB
MOTIN3	A3FE	MOTIN9	A3EA	MSENTB	BF0C	MSEERVE	B216
NBYTAB	BE7F	NDURAT	00D4	NDURTM	00D8	NEWST1	B7D7
NEWST2	B7BE	NEWST3	B7B5	NEWST4	B7BE	NEWST5	B7A9
NEWST6	B7F0	NEWSTR	B764	NMIEN	D40E	NMIRE5	D40F

NHIST	D40F	NOISE	AEAB	NOISE1	AEB1	NOISE2	AEC9
NOISE3	AEB3	NOISTB	BF20	NOITB1	BF2A	NOITB2	BF34
NOTSTAR	17E3	NOTIN1	B3AF	NOTIN2	B3B9	NOTINT	B3A6
NOTSEQ	00D2	NOTTAB	BF5C	NOTVOL	00D9	NPRIOR	00D6
NSTARS	0079	NIEMP	006F	NUMBYT	0CEE	NUMPTS	00A4
OBCOMP	0003	OBJCL1	A569	OBJCL2	A579	OBJCL1	A4ED
OBJCL2	A4E7	OBJCL3	A503	OBJCL4	A4FC	OBJCL5	A548
OBJCL6	A52E	OBJCL7	A53E	OBJCL8	A52A	OBJNUM	0005
OBLAST	0004	OBPHOT	0002	OLDBYT	0C8D	OLDHOR	0C8C
OLDNUM	0C8D	OLDVER	0C5B	POPF	D004	POPL	D00C
P1PF	D005	P1PL	D00D	P2PF	D006	P2PL	D00E
P3PF	D007	P3PL	D00F	PACTL	D302	PAGE0	0067
PAND10	B896	PAND1S	B804	PANDS1	B822	PANDS2	B812
PANDS3	B810	PANDS4	B85C	PANDS5	B8A6	PANDS6	B86F
PANDS7	B88E	PANDS8	B88C	PANDS9	B8A6	PBCTL	D303
PENH	D40C	PENV	D40D	PGRAP0	0400	PGRAP1	0500
PGRAP2	0600	PGRAP3	0700	PGRAPH	0300	PHASE2	0300
PHASE3	2000	PHASE4	00FC	PHASE5	BFFB	PHASE7	0FE9
PHASE8	A14A	PHASE9	C000	PHXWT	00BE	PHGRAF	B8E4
PHGRF1	B8F5	PHGRF2	B903	PHGRF3	B90F	PHGRF4	B919
PHGRF5	B921	PHITS	0082	PHODIF	BF85	PHOFLG	0084
PHOREP	00DA	PHOTB2	BFE8	PHOTB4	BFF3	PHOTIM	0085
PHOTN2	AE40	PHOTN3	AE56	PHOTN4	AE58	PHOTN7	AE66
PHOTN8	AE41	PHOTOQ	0087	PHOTON	AE29	PHOYP8	BF73
PHPOSB	BF7D	PHPOST	BF75	PHVECT	BFC9	PIA	D300
PMBASE	D407	PNTR	0068	POHELP	AECA	POHLP1	AED2
POHLP2	AEDA	POKEY	D200	POPALL	A748	PORTA	D300
PORTB	D301	POTO	D200	POT1	D201	POT2	D202
POT3	D203	POT4	D204	POT5	D205	POT6	D206
POT7	D207	POTQ0	D208	PRIOR	D01B	PROGST	0067
PTAB	0DE9	QUADRT	0090	RAMMAP	0280	RAMNUM	0031
RANDOM	D20A	RANKTB	BEE9	RATING	00CB	RED	0044
RDFLG	008B	REPM50	0065	REPTR	00D7	REPSEQ	00D3
RESET	0063	RMLAST	0030	ROGRAF	BA12	ROGRF1	BA1B
ROGRF2	BA23	ROGRF3	BA2A	ROGRF4	BA30	ROGRF5	BA34
ROHELP	B69B	ROHLP1	B6A4	ROHLP2	B6E1	ROTTIM	00BA
SCBCD	0064	SCPTAB	0051	SCVCON	002B	SDURAT	00D5
SECOND	0074	SENABR	BC20	SENACF	BBAE	SENACN	BBAB
SENATA	BBD9	SENCDM	BC11	SENCDS	BC14	SENCOM	BBFA
SENCTF	BBB8	SENCTN	BBB5	SENDES	BBBF	SENDKA	BBF9
SENDMC	BBFC	SENDST	BBBD	SENEDE	BC05	SENEDS	BC08
SENETC	BBCB	SENHSP	BBB5	SENHWA	BBB1	SENHWC	BBB3
SENHYP	BBBB	SENMDM	BC1B	SENMDS	BC1D	SENNOV	BBF4
SENORB	BBB6	SENOUT	BBDB	SENPDN	BBFF	SENPD9	BC02
SENPL	BBF6	SENPTR	00D1	SENRED	BC1F	SENSDM	BC0B
SENSDS	BC0E	SENSOF	BBB3	SENSON	BBB1	SENSUR	BBBD
SENTAB	BBAA	SENTDM	BC17	SENTDS	BC19	SENWAR	BBF8
SENWHT	BBBA	SENWIN	BBE9	SEGEN	00A8	SEGTIM	00AA
SERIN	D20D	SEROUT	D20D	SESCAN	A0F8	SHENER	007D
SIZEM	D00C	SIZEP0	D008	SIZEP1	D009	SIZEP2	D00A
SIZEP3	D00B	SKCTL	D20F	SKRES	D20A	SKSTAT	D20F
SPABAK	0081	SPEED	0070	SSERV1	A4E5	SSERV2	A4C0
SSERV3	A4CA	SSERV4	A4DB	STERMK	00C6	STERTB	BED7
STFLAG	00E9	STHP05	B6F8	STHP52	B709	STHP53	B717
STIMER	D209	STINIT	BB42	STLAST	0010	STO0B1	A28A
STO0B2	A2E0	STO0B3	A306	STO0B5	A327	STO0B6	A343
STO0B7	A30E	STO0B8	A2C2	STO0B9	A2E8	STOSR1	A250
STOSR2	A227	STOSR3	A262	STRBR1	A593	STRBR2	A58D
STRBR4	A5AB	STRBR5	A5A5	STRBR6	A5A3	STRBYT	0CEE
STRNUM	000C	STRRAM	09AD	STVPOS	B71E	STVPS1	B75A

STVPS2	B72E	STVPS3	B753	STVPS4	B764	STVPS5	B745
STVPS6	B74A	STVPS7	B73E	STVPS8	B763	TARPTR	00A2
TEMP	006A	TEMP1	006B	TEMP2	006C	TEMP3	006D
TEMP4	006E	THEKEY	00CA	THIN10	AC0A	THIN11	ABCA
THIN12	ABE1	THIN13	AC31	THIN14	AB35	THIN15	AC4F
THIN16	AC32	THIN20	AB11	THIN22	ABE9	THIN23	ABEB
THIN24	ABFA	THIN26	AB98	THIN27	AB9C	THIN28	ABBB
THIN30	ABC4	THIN31	ABBA	THIN33	ABE5	THIN35	ABAE
THIN36	ABDD	THIN37	AA90	THIN38	AAB3	THIN39	AAB5
THIN40	AACB	THIN41	AACF	THIN42	AAD5	THIN43	AADD
THIN44	AAE0	THIN45	AB66	THINK	AA79	THINK1	AB09
THINK2	AB03	THINK3	AAF4	THINK4	AB00	THINK5	AB37
THINK6	ABBA	THINK8	ABFC	THINK9	AC0B	TIME10	B544
TIME11	B59A	TIME12	B57C	TIME13	B5B0	TIME14	B5DA
TIME15	B5C1	TIME16	B5D1	TIME18	B5EA	TIME19	B619
TIME20	B5EF	TIME21	B601	TIME22	B655	TIME23	B662
TIME24	B664	TIME25	B68D	TIME26	B644	TIME27	B632
TIME28	B5BB	TIME30	B53E	TIME31	B516	TIME32	B50F
TIME33	B51A	TIME40	B61D	TIME42	B6BF	TIME44	B61C
TIME45	B698	TIME46	B4F5	TIME47	B511	TIME41	B574
TIMER1	B569	TIMER2	B54E	TIMER3	B565	TIMER4	B562
TIMER5	B56A	TIMER6	B51C	TIMER7	B527	TIMER9	B536
TIMER8	B4E4	TIMERX	0072	TIMHLP	B7F1	TIMHP1	B803
TIMOUT	0066	TOFFMG	BE26	TOGTAB	BE29	TONMSG	BE2C
TRIG0	D010	TRIG1	D011	TRIG2	D012	TRIG3	D013
TRKFL0	007C	TRKTAB	BECF	TWOCM1	B8BD	TWOCM3	B8CD
TWOCM0	B8A7	UPIN10	A7E9	UPIN11	A85F	UPIN12	A83A
UPIN13	AB3C	UPIN14	AB50	UPINS1	AB98	UPINS2	A7EC
UPINS3	AB30	UPINS4	AB04	UPINS5	AB0A	UPINS6	AB21
UPINS7	AB27	UPINS8	A7CF	UPINS9	A7E1	UPINST	A7BF
VLNKK1	A6E9	VLNKK2	A6F2	VLNKK3	A6F6	VLNKK4	A6EA
VLNKK5	A715	VBNNI	A6D1	VCONH	0B64	VCONL	0B00
VCOUNT	D40B	VDELAY	D01C	VDRAW	00A5	VDSLST	0200
VERCHT	003F	VERJDY	00C9	VIMIRG	0216	VMAX	0064
VBCEN	007A	VOFLOW	0032	VPOS	0BF9	VSCROL	D405
VSTCEN	0032	VSTEER	00C5	VTARGT	00A1	VVBLKI	0222
WARP	0071	WARPTB	BAB4	WENTAB	BAD3	WPENER	00B0
WRDTAB	BC2B	WSYNC	D40A	XINCRE	0B66	XINDES	00AC
XINPRS	00B2	XMOVE1	A3BD	XMOVE2	A3C6	XMOVE3	A3DF
XPOSH	0A40	XPOSL	0AD3	XSIGN	09AD	YELLOW	0026
YINCRE	0B97	YINDES	00AE	YINIT	BB3A	YPOSH	0A71
YPOSL	0B04	YROTA1	A39E	YROTA2	A3B9	YSIGN	09DE
ZINCRE	0BCB	ZINDES	00B0	ZINIT	BB3E	ZPOSH	0AA2
ZPOSL	0B35	ZROTA1	A3BB	ZROTA2	A3A6	ZSIGN	0A0F
ZYGIND	BF89	ZYGRAF	B9B1	ZYGRF1	B9BE	ZYGRF2	B9C6
ZYGRF3	B9CC	ZYGRF4	B9D2	ZYGRF5	B9D6	ZYGRF6	B9DA
ZYGRF7	B9DC	ZYTARG	BF6E	ZYTOGG	00A7	ZYWARP	BF99